QUA 6209

VOL-31/1449

1-21

Library of the Museum

OF

COMPARATIVE ZOÖLOGY,

AT HARVARD COLLEGE, CAMBRIDGE, MASS.

Founded by private subscription, in 1861.

Deposited by ALEX. AGASSIZ.

No. 7527

May 5 - Dec. 15. 1890

MAY 5 1890

MUSEUM OF COMPARATIVE ZOOLOGY CAMBRIDGE, MASS.

New Series, No. CXXI (Vol. XXXI, Part 1). Price 10s.

7527.

APRIL, 1890.

1449
1-21

THE

QUARTERLY JOURNAL

OF

MICROSCOPICAL SCIENCE.

EDITED BY

E. RAY LANKESTER, M.A., LL.D., F.R.S.,

Honorary Fellow of Exeter College, Oxford, and Jodrell Professor of Zoology in University College, London;

WITH THE CO-OPERATION OF

E. KLEIN, M.D., F.R.S.,

Lecturer on General Anatomy and Physiology in the Medical School of St. Bartholomew's Hospital, London,

AND

ADAM SEDGWICK, M.A., F.R.S.,

Fellow and Assistant-Lecturer of Trinity College, Cambridge.

WITH LITHOGRAPHIC PLATES AND ENGRAVINGS ON WOOD.

LONDON:

J. & A. CHURCHILL, 11, NEW BURLINGTON STREET.

MDCCCXC.

Adlard and Son.] [Bartholomew Close.

MUSEUM OF COMPARATIVE ZOOLOGY HARVARD

CONTENTS OF No. CXXI.—New Series.

MEMOIRS:

PAGE

On Phymosoma varians. By Arthur E. Shipley, M.A., Fellow and Lecturer of Christ's College, Cambridge, and Demonstrator of Comparative Anatomy in the University. (With Plates I, II, III, and IV) 1

The Spinning Apparatus of Geometric Spiders. By Cecil Warburton, B.A., Christ's College, Cambridge. (With Plate V) . 29

On the Structure and Functions of the Cerata or Dorsal Papillæ in some Nudibranchiate Mollusca. By W. A. Herdman, D.Sc., F.L.S., Professor of Natural History in University College, Liverpool. (With Plates VI, VII, VIII, IX, and X) 41

Further Observations on the Histology of Striped Muscle. By C. F. Marshall, M.B., M.Sc., late Platt Physiology Scholar in the Owens College. (With Plate XI) 65

On Chætobranchus, a New Genus of Oligochætous Chætopoda. By Alfred Gibbs Bourne, D.Sc.Lond., F.L.S., C.M.Z.S., Fellow of University College, London, and of the Madras University. (With Plate XII) 83

The Presence of Ranvier's Constrictions in the Spinal Cord of Vertebrates. By Dr. William Townsend Porter, of St. Louis. (With Plate XII *bis*) 91

Professor Bütschli's Experimental Imitation of Protoplasmic Movement 99

New Series, No. CXXII (Vol. XXXI, Part 2). Price 10s.

JUNE, 1890.

AUG 25 1890

7527.

THE QUARTERLY JOURNAL OF MICROSCOPICAL SCIENCE.

EDITED BY

E. RAY LANKESTER, M.A., LL.D., F.R.S.,

Honorary Fellow of Exeter College, Oxford, and Jodrell Professor of Zoology in University College, London;

WITH THE CO-OPERATION OF

E. KLEIN, M.D., F.R.S.,

Lecturer on General Anatomy and Physiology in the Medical School of St. Bartholomew's Hospital, London,

AND

ADAM SEDGWICK, M.A., F.R.S.,

Fellow and Assistant-Lecturer of Trinity College, Cambridge.

WITH LITHOGRAPHIC PLATES AND ENGRAVINGS ON WOOD.

LONDON:

J. & A. CHURCHILL, 11, NEW BURLINGTON STREET.

MDCCCXC.

Adlard and Son.] [Bartholomew Close.

T. H. Bp.

MUSEUM OF COMPARATIVE ZOOLOGY
CAMBRIDGE, MASS.

CONTENTS OF No. CXXII.—New Series.

MEMOIRS:

PAGE

The Embryology of a Scorpion (Euscorpius italicus). By Malcolm Laurie, B.Sc., Falconer Fellow of Edinburgh University. (With Plates XIII—XVIII) 105

On the Morphology of the Compound Eyes of Arthropods. By S. Watase, Fellow of the Johns Hopkins University. (With Plate XIX) 143

On the Structure of a Species of Earthworm belonging to the Genus Diachæta. By Frank E. Beddard, M.A., Prosector to the Zoological Society of London. (With Plate XX) . . . 159

Hekaterobranchus Shrubsolii, a New Genus and Species of the Family Spionidæ. By Florence Buchanan, Student of University College. (With Plates XXI and XXII) 175

An Attempt to Classify Earthworms. By W. B. Benham, D.Sc., Assistant to the Jodrell Professor of Zoology, in University College, London 201

3

New Series, No. CXXIII (Vol. XXXI, Part 3). Price 10s.

7527.

AUGUST, 1890.

THE QUARTERLY JOURNAL OF MICROSCOPICAL SCIENCE.

EDITED BY

E. RAY LANKESTER, M.A., LL.D., F.R.S.,

Honorary Fellow of Exeter College, Oxford; Jodrell Professor of Zoology in University College, London; and Deputy Linacre Professor of Human and Comparative Anatomy in the University of Oxford.

WITH THE CO-OPERATION OF

E. KLEIN, M.D., F.R.S.,

Lecturer on General Anatomy and Physiology in the Medical School of St. Bartholomew's Hospital, London,

AND

ADAM SEDGWICK, M.A., F.R.S.,

Fellow and Assistant-Lecturer of Trinity College, Cambridge.

WITH LITHOGRAPHIC PLATES AND ENGRAVINGS ON WOOD.

LONDON:

J. & A. CHURCHILL, 11, NEW BURLINGTON STREET.

MDCCCXC.

Adlard and Son.] [Bartholomew Close.

CONTENTS OF No. CXXIII.—New Series.

MEMOIRS:

PAGE

On the Origin of Vertebrates from Arachnids. By William Patten, Ph.D., Professor of Biology in the University of North Dakota, Grand Forks. (With Plates XXIII and XXIV) . . . 317

On the Origin of Vertebrates from a Crustacean-like Ancestor. By W. H. Gaskell, M.D., F.R.S. (With Plates XXV, XXVI, XXVII, XXVIII) 379

The Development of the Atrial Chamber of Amphioxus. By E. Ray Lankester, M.A., LL.D., F.R.S., and Arthur Willey, Student of University College. (With Plates XXIX, XXX, XXXI, XXXII) 445

New Series, No. CXXIV (Vol. XXXI, Part 4). Price 10s.

7524.

NOVEMBER, 1890.

THE QUARTERLY JOURNAL OF MICROSCOPICAL SCIENCE.

EDITED BY

E. RAY LANKESTER, M.A., LL.D., F.R.S.,

Honorary Fellow of Exeter College, Oxford; Jodrell Professor of Zoology in University College, London; and Deputy Linacre Professor of Human and Comparative Anatomy in the University of Oxford.

WITH THE CO-OPERATION OF

E. KLEIN, M.D., F.R.S.,

Lecturer on General Anatomy and Physiology in the Medical School of St. Bartholomew's Hospital, London,

AND

ADAM SEDGWICK, M.A., F.R.S.,

Fellow and Assistant-Lecturer of Trinity College, Cambridge.

WITH LITHOGRAPHIC PLATES AND ENGRAVINGS ON WOOD.

LONDON:
J. & A. CHURCHILL, 11, NEW BURLINGTON STREET.

MDCCCXC.

Adlard and Son,] [Bartholomew Close.

CONTENTS OF No. CXXIV.—New Series.

MEMOIRS:

PAGE

On the Structure of a New Genus of Oligochæta (Deodrilus), and on the Presence of Anal Nephridia in Acanthodrilus. By Frank E. Beddard, M.A., Prosector of the Zoological Society of London. (With Plates XXXIII and XXXIIIa) . . 467

Excretory Tubules in Amphioxus lanceolatus. By F. Ernest Weiss, B.Sc., F.L.S., University College, London. (With Plates XXXIV and XXXV) 489

Studies in Mammalian Embryology. II.—The Development of the Germinal Layers of Sorex vulgaris. By A. A. W. Hubrecht, LL.D., C.M.Z.S., Professor of Zoology in the University of Utrecht. (With Plates XXXVI—XLII) 499

Terminations of Nerves in the Nuclei of the Epithelial Cells of Tortoise-shell. By John Berry Haycraft, M.D., D.Sc. (from the Physiological Laboratory of the University of Edinburgh). (With Plate XLIII) 563

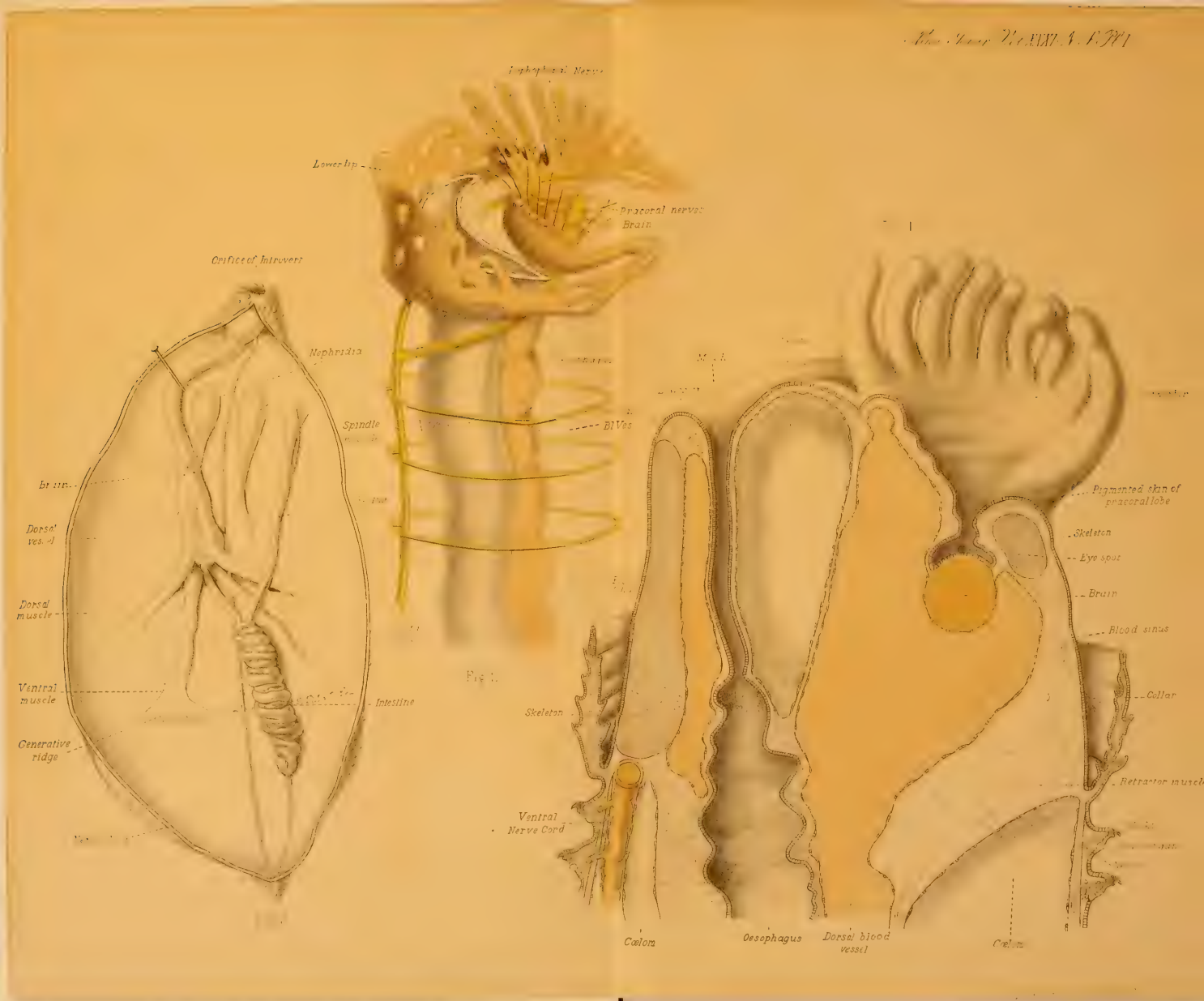

Lower lip
Praeoral nerves
Brain
Orifice of Introvert
Nephridia
Spindle
Bl Ves
Brain
Dorsal vessel
Dorsal muscle
Ventral muscle
Generative ridge
Intestine
Skeleton
Ventral Nerve Cord
Cœlom
Oesophagus
Dorsal blood vessel
Pigmented skin of praeoral lobe
Skeleton
Eye spot
Brain
Blood sinus
Collar
Retractor muscle

Fig. 5.

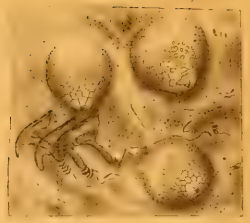
Fig. 6.

Fig. 10

Fig. 8.

Fig. 11

Fig. 13



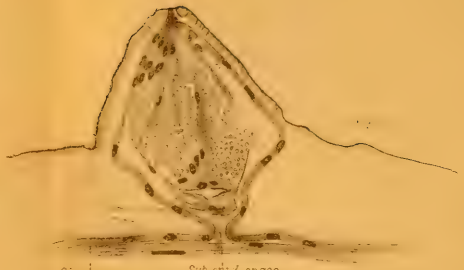
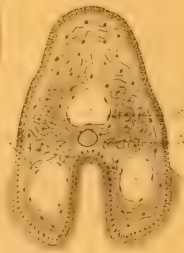


Fig. 16.



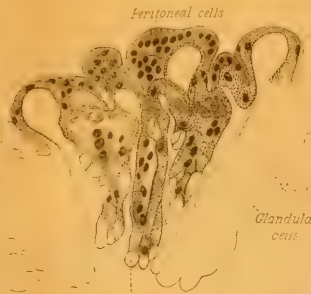


Fig. 17

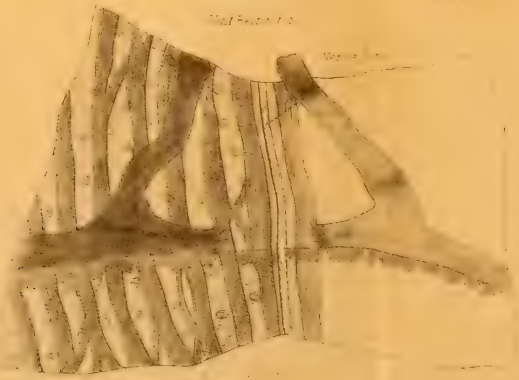
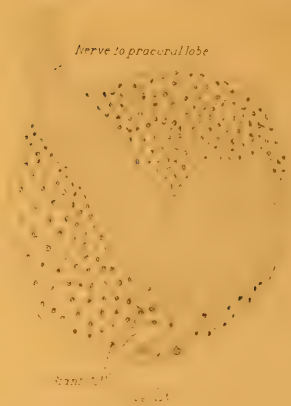


Fig. 21

Lith. & Imp. Comb. Set. Inst. Co.

Fig 23.



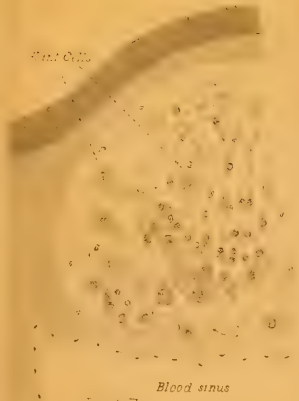


Fig 27.

Fig 30

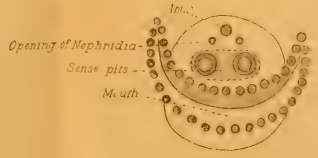


Fig 31

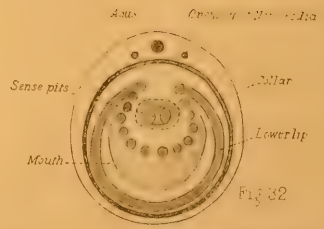


Fig 32

Lith & Imp Camb Sci Inst

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

Fig. 7.

Fig. 8.

Fig. 9.

Fig. 10.

Fig. 11.

Fig. 12.

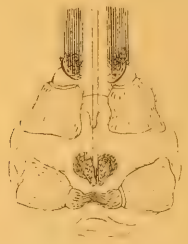


Fig. 13.

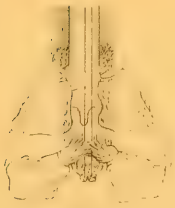


Fig. 14.

Fig. 15.

Fig. 17.

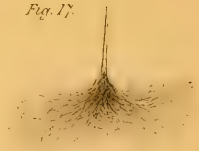


Fig. 16.

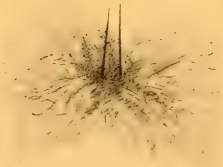


Fig. 18.

Fig. 19.

Fig. 20.

F. Huth, Lith^r Edin^r

Fig. 1.

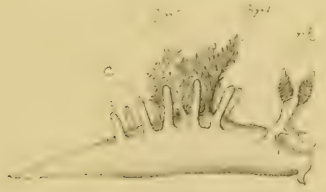


Fig. 3.

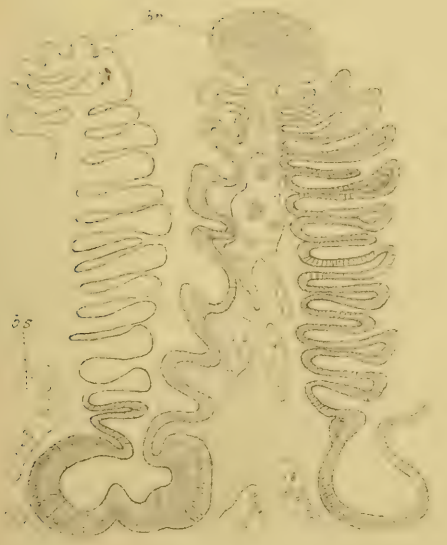


Fig. 2.

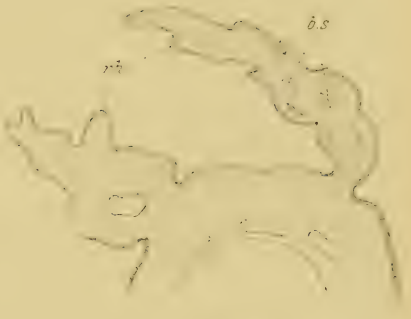


Fig. 4.

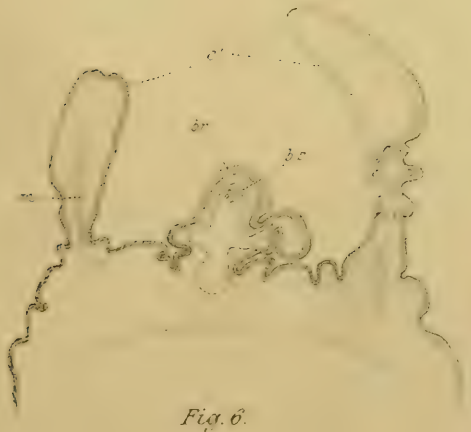


Fig. 6.

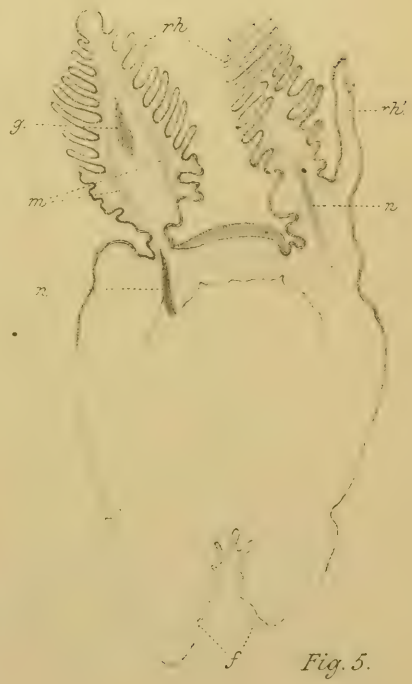
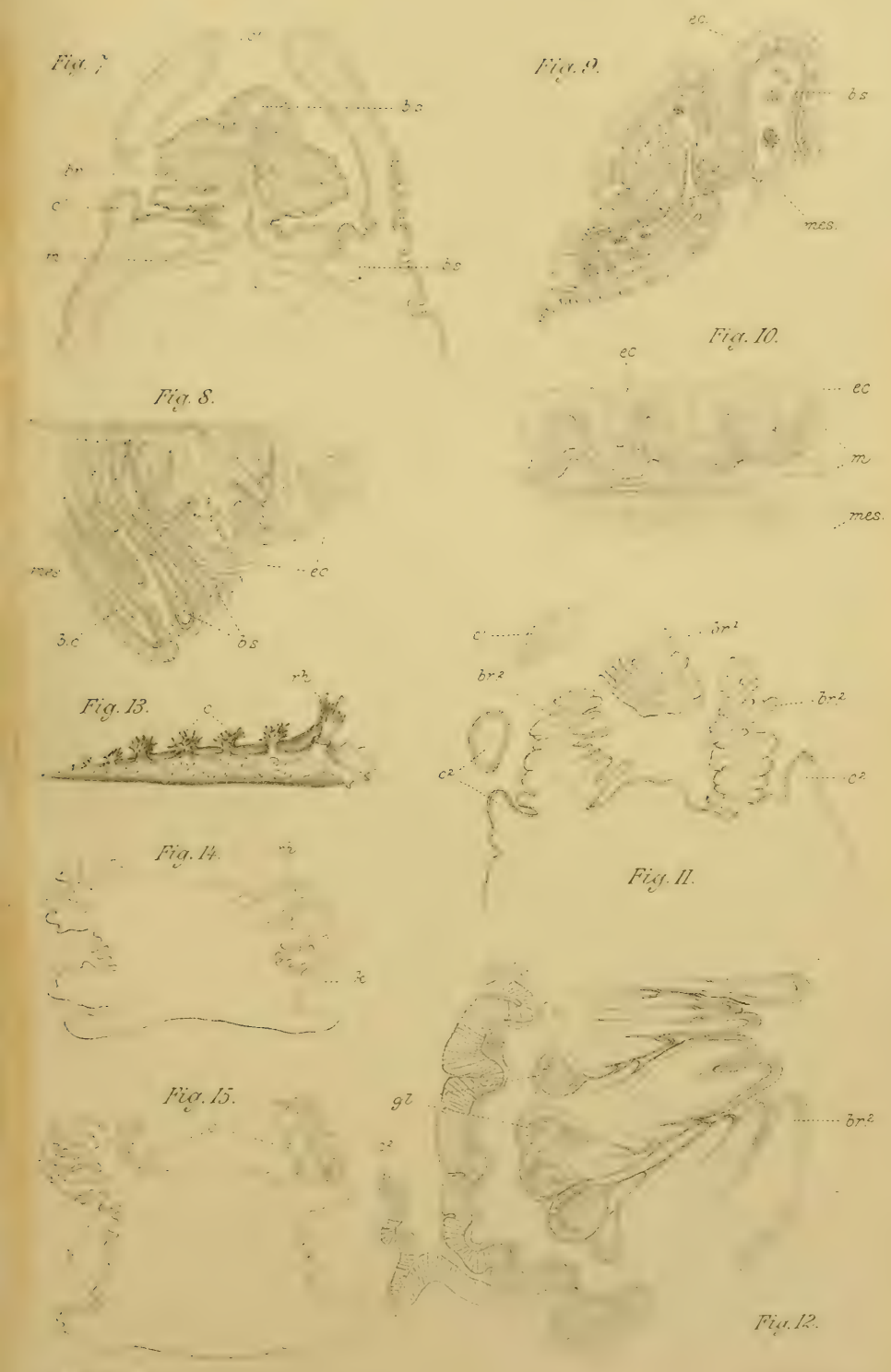


Fig. 5.

W. A. Herdman del.

F. Huth, Lith^r Edin^r

DORIS. ANCULA.



W. A. Herdman del.

F. Huth, Lith^r Edin^r

ANCULA. TRITONIA.

Fig. 16.

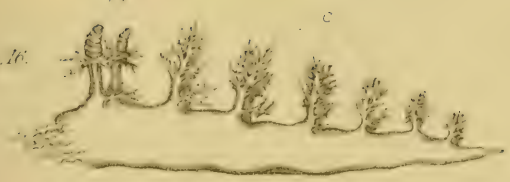


Fig. 17.

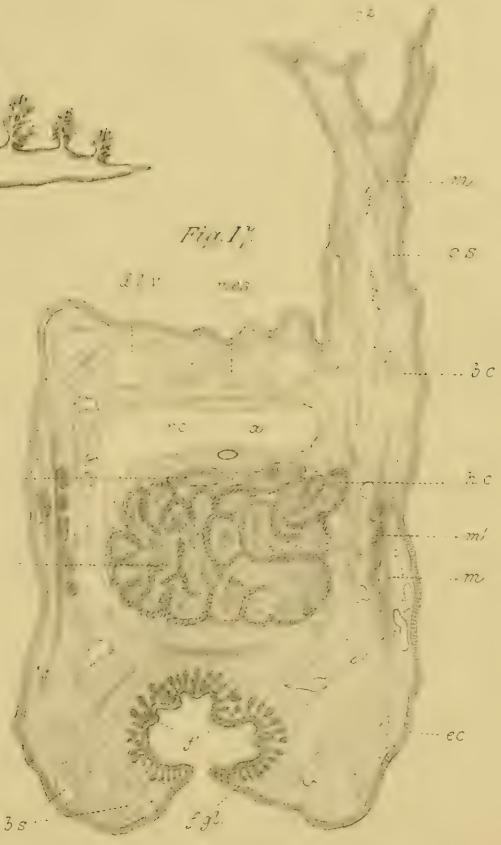


Fig. 18.

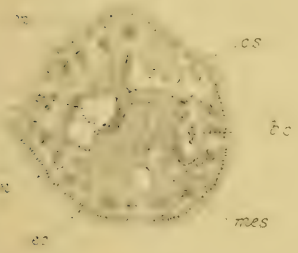


Fig. 19.

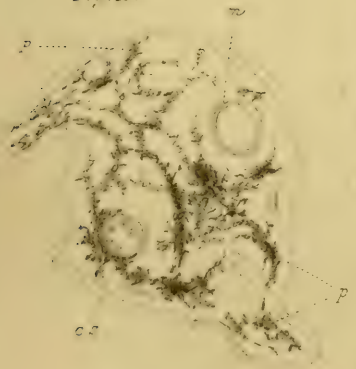


Fig. 20.

Fig. 21.

W. A. Herdman, del. F. Huth, Lith^r Edin^r

DENDRONOTUS.

Fig. 23.

Fig. 22.

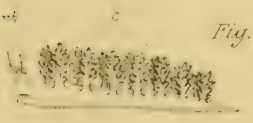


Fig. 24

Fig. 25.

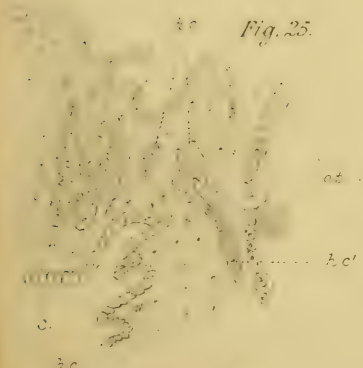


Fig. 26.

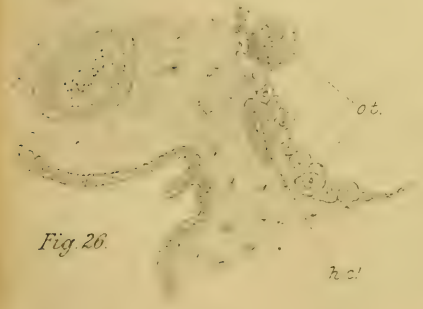
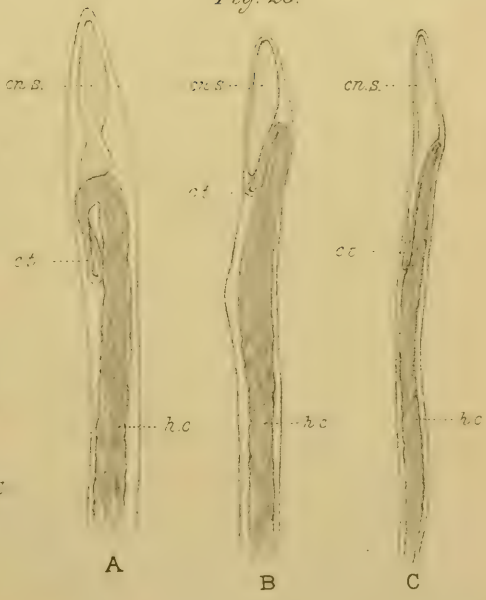


Fig. 27.

Fig. 28.



W.A.Herdman del.

F. Huth, Lith^r Edin^r

DOTO. EOLIS.

Fig. 29.

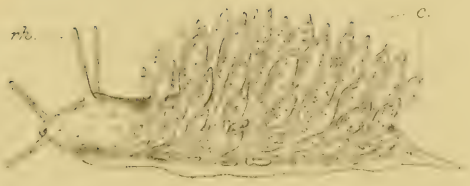


Fig. 30.

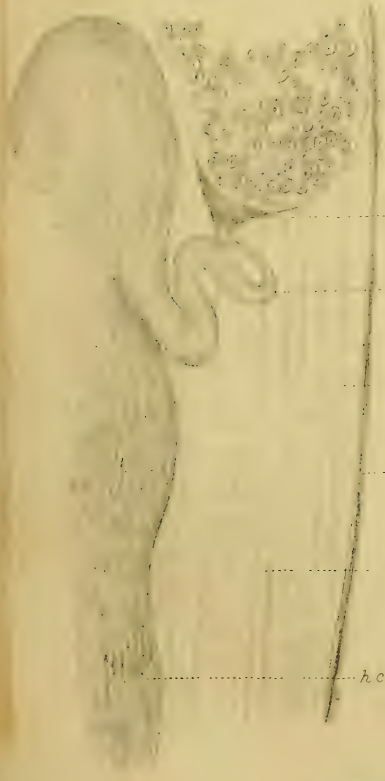


Fig. 32.

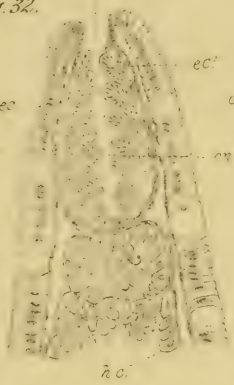


Fig. 31.

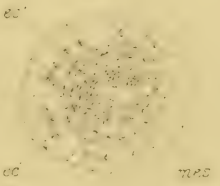


Fig. 33.

Fig. 40.

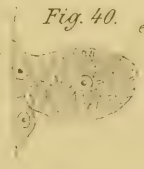


Fig. 38

Fig. 39.

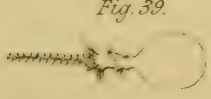


Fig. 34.

Fig. 36.

Fig. 37.

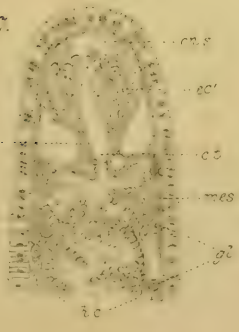
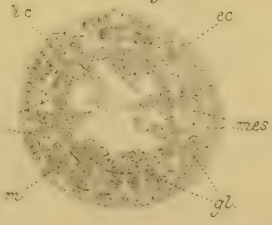


Fig. 35.



A. Hartman del.

F. Huth, Lith. Edin.

EOLIS.

Fig. 1.
× 490

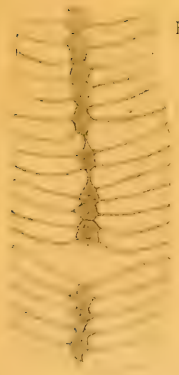


Fig. 2
× 1090

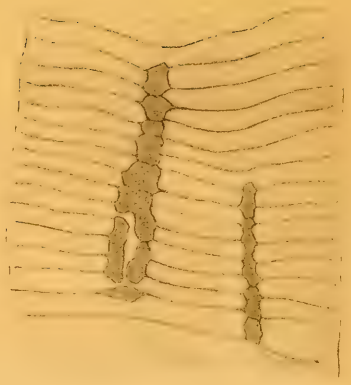


Fig. 3
× 1090

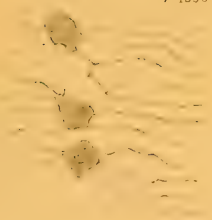


Fig. 5
× 1090

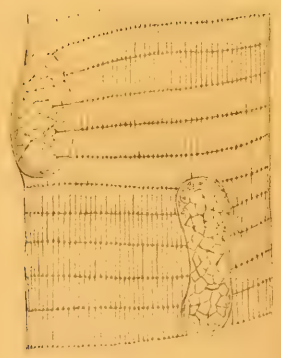


Fig. 6
× 1090

Fig. 4
× 890

Fig. 7.
× 890

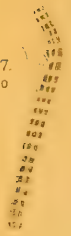


Fig. 8.
× 890

Fig. 9.
× 2800

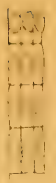


Fig. 10.
× 890

Fig 11.
× 1090

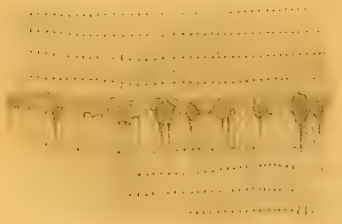


Fig 13

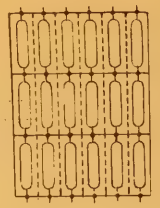


Fig. 12.
× 890

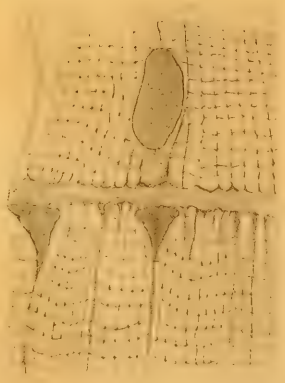


Fig 14.

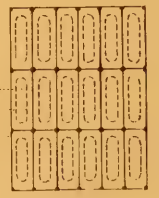
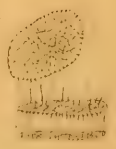
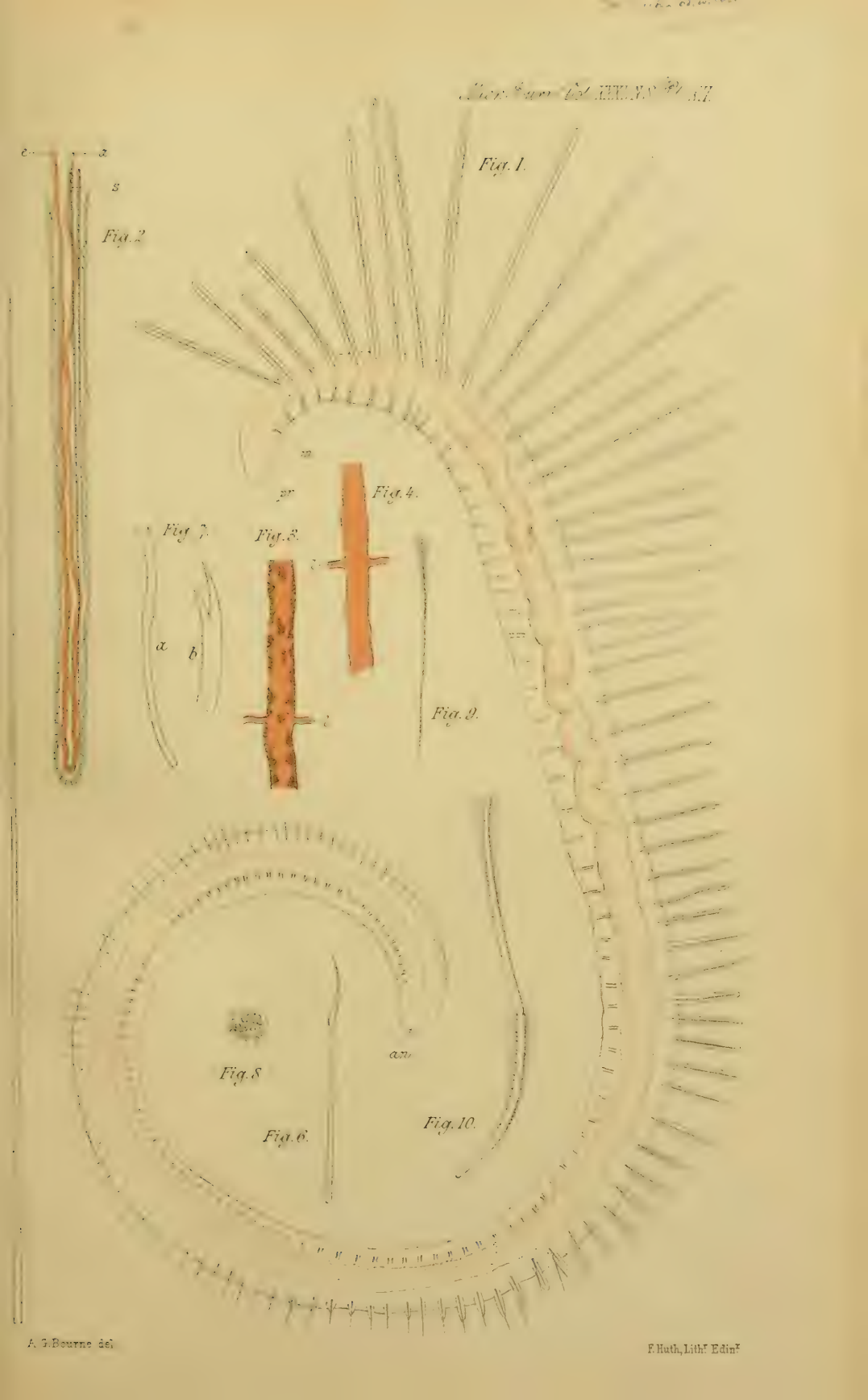


Fig 15.





A. G. Bourne del.

F. Huth, Lith^r Edin^r

Fig. 1

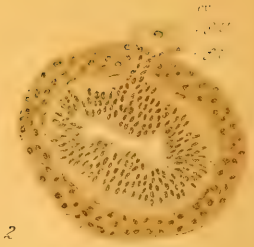


Fig. 2

Fig. 3.

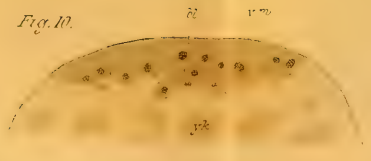
Fig. 4

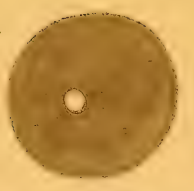
Fig. 6

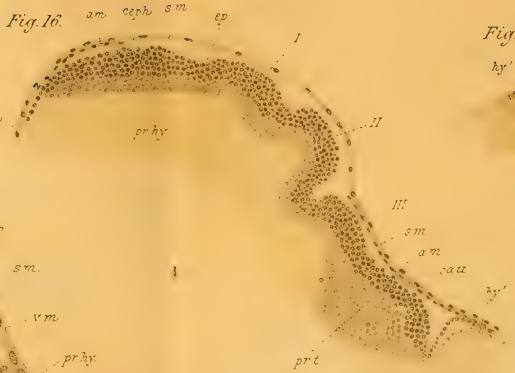
Fig. 5.

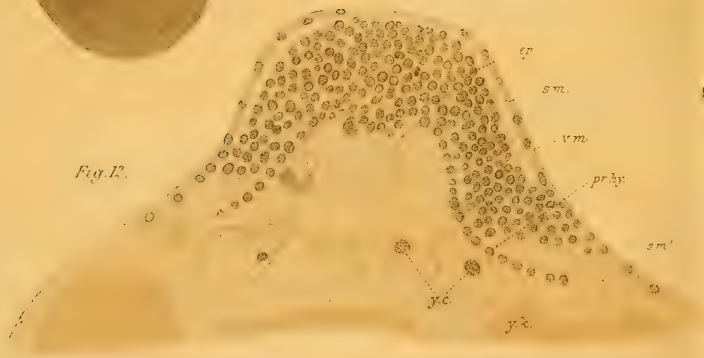
Fig. 7.

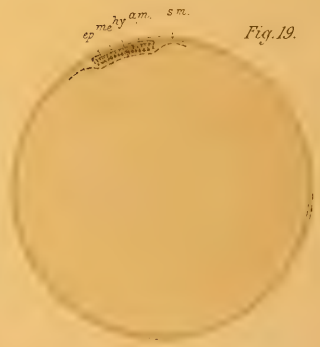
F. Heath, Lith^r Edin^r

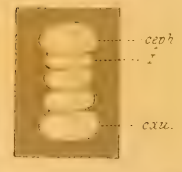


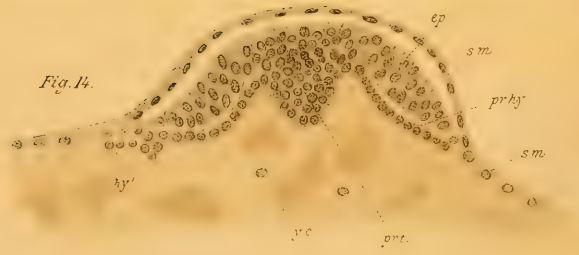


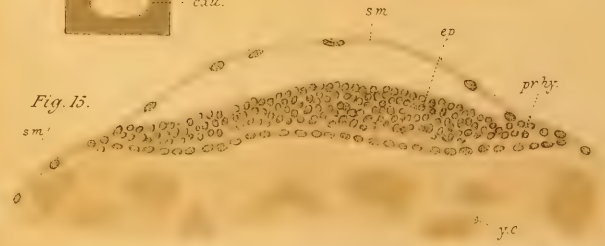












F Huth, Lith^r Edin^r

Fig. 21.

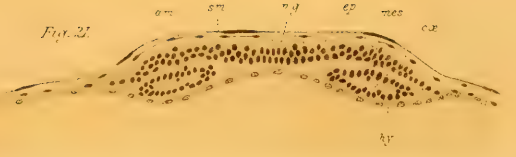


Fig. 23.

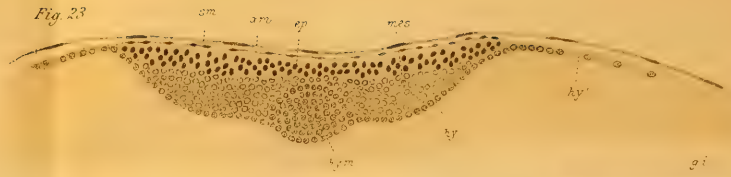


Fig. 20.

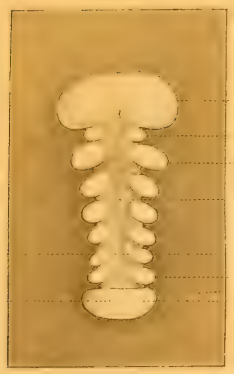


Fig. 22.

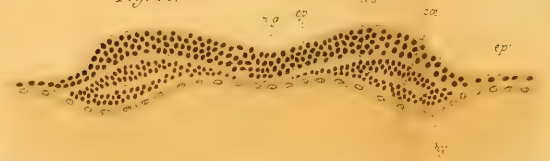


Fig. 24.

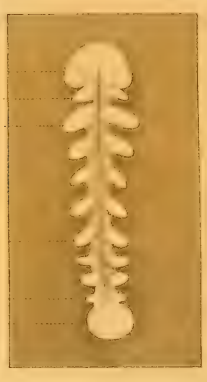


Fig. 28.

Fig. 25.

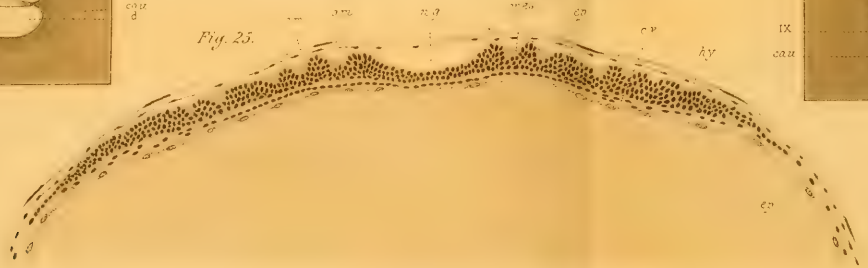


Fig. 27.

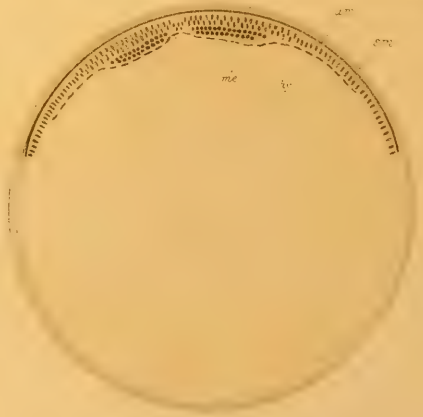
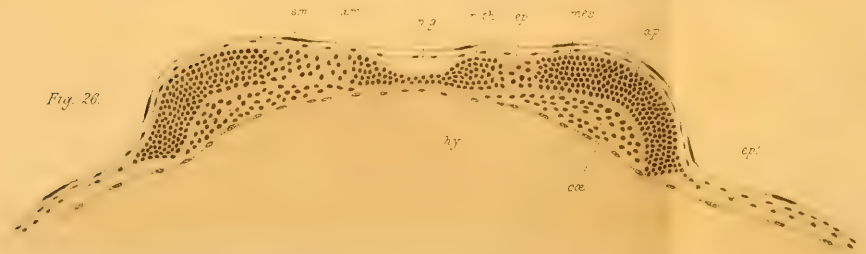


Fig. 26.



F Ruth, Lith^r Edin^r

Fig. 29

Fig. 30

Fig. 31

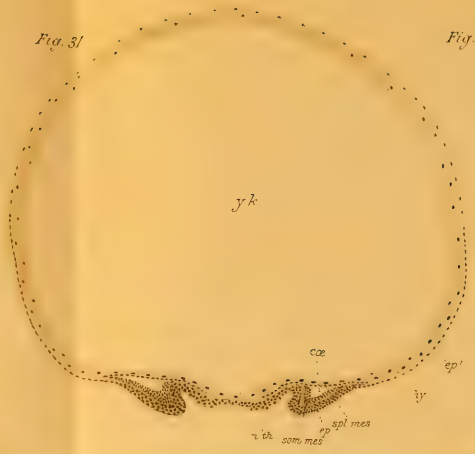


Fig. 32.

Fig. 33

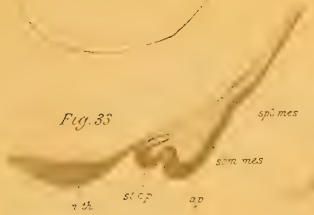


Fig. 36

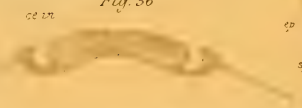


Fig. 35.

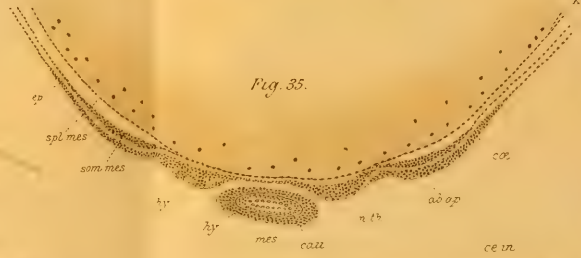


Fig. 34.

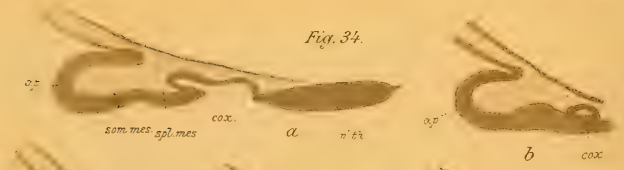
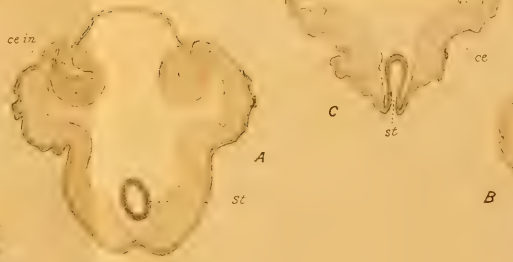
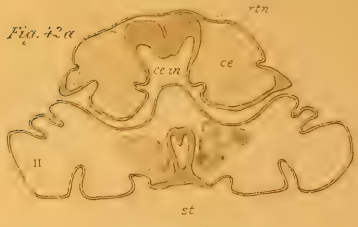
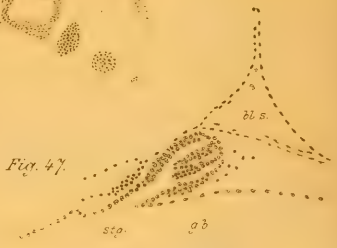


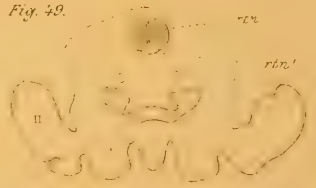
Fig. 37.

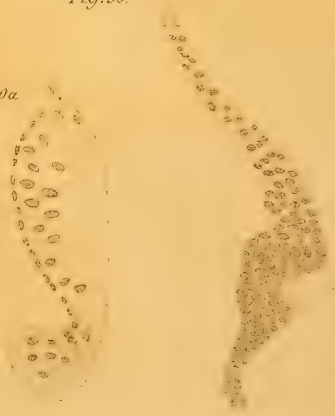


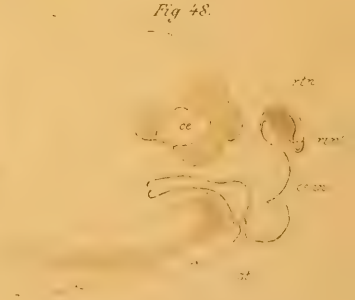
F. Huth, Lith. Edin.











F Huth, 14th Edin.r

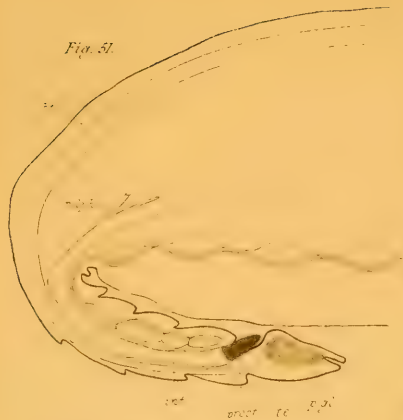


Fig. 51.

Fig. 52.

Fig. 53.

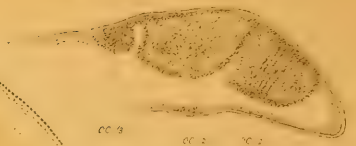


Fig. 59.

Fig. 61.

Fig. 56.

Fig. 57.

Fig. 54.

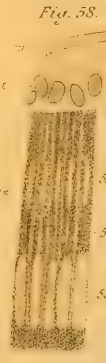


Fig. 58.

Fig. 58 c

Fig. 58 b

Fig. 58 a

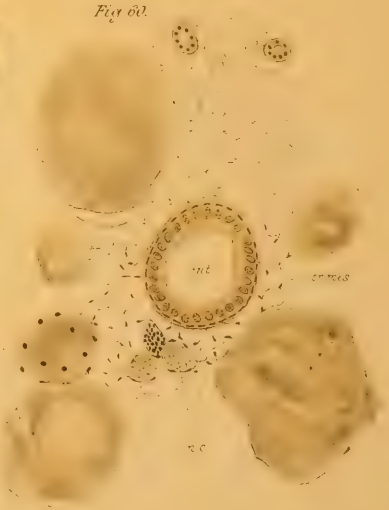
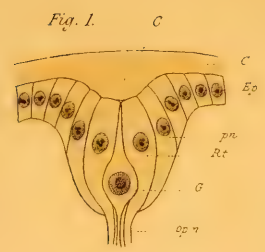
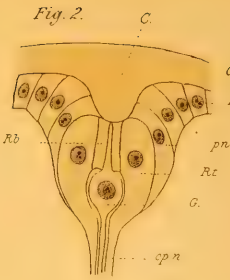


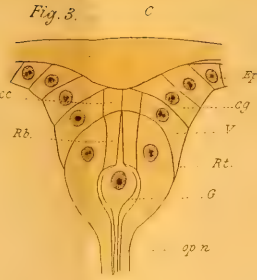
Fig. 60.

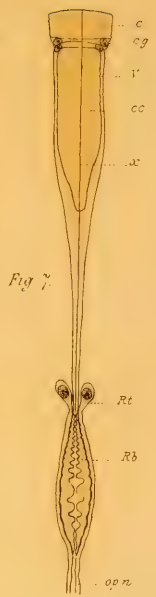
Fig. 55.

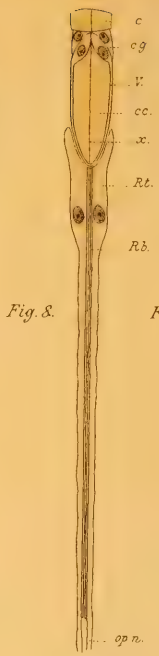
F Huth, Lith.r Edin.r

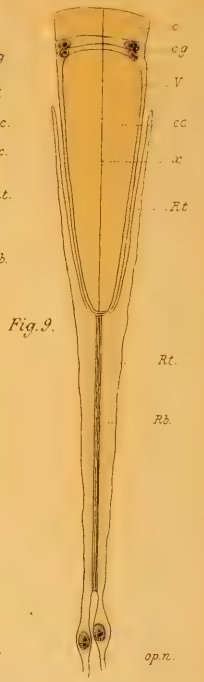


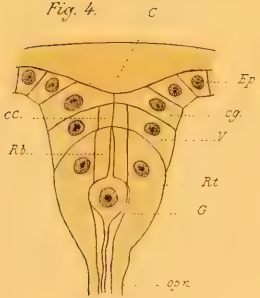


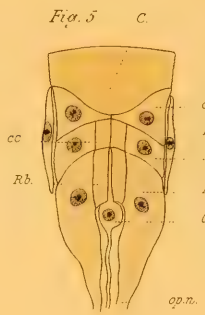


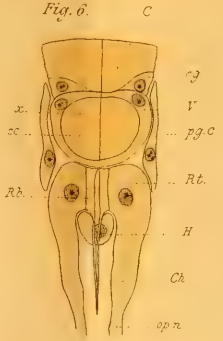


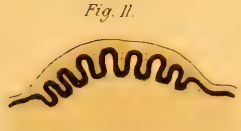






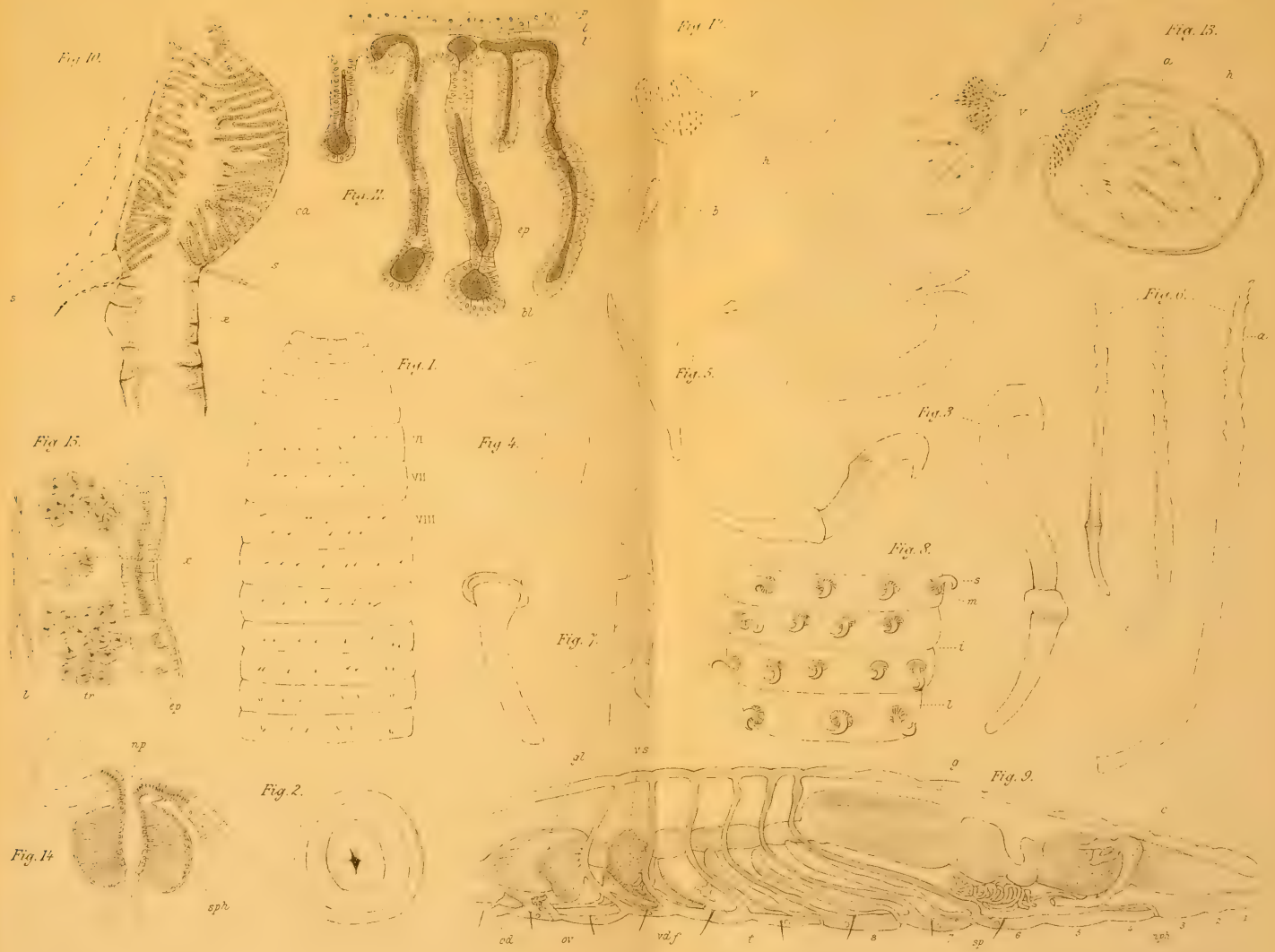






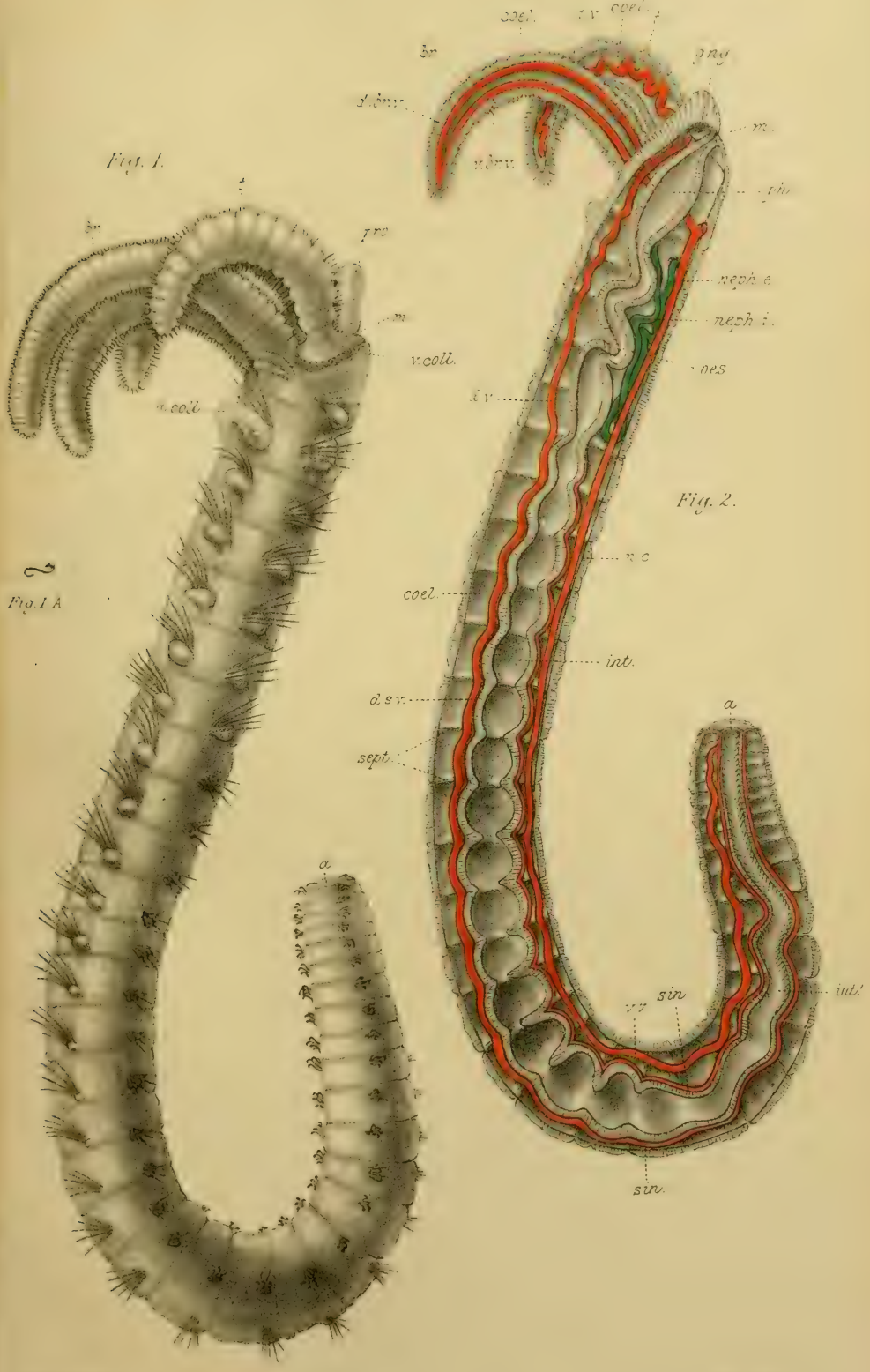
ORIGIN OF THE COMPOUND EYE OF ARTHROPODS.

F. Huth, Lith^r Edin^r



F. E. Beddard del.

F. Huth, Lith^r Edin^r

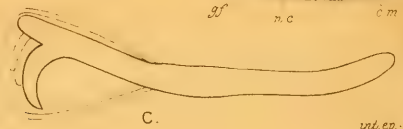


F. Buchanan del.

F. Huth, Lith^r Edin^r

Fig. 3.

Fig. 4.



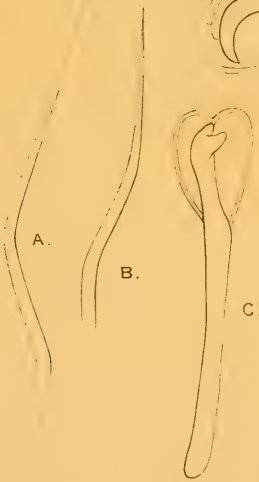


Fig. 11.

Fig. 5.

Fig. 6.

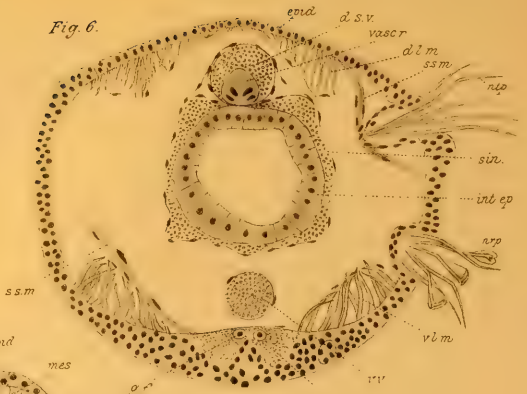


Fig. 7.

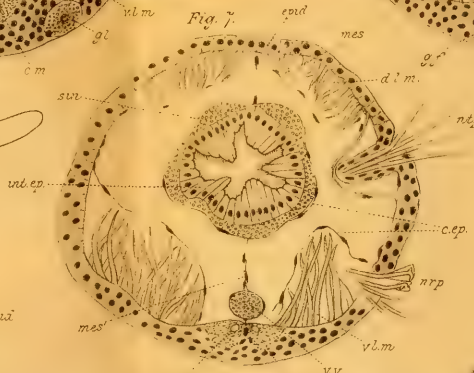


Fig. 9.

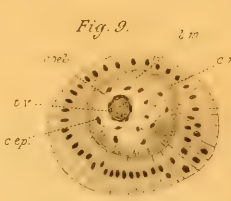


Fig. 10.

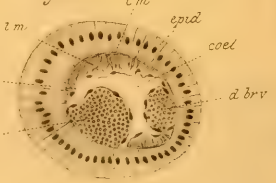


Fig. 8.

Fig. 13.

Fig. 14.

Fig. 12.

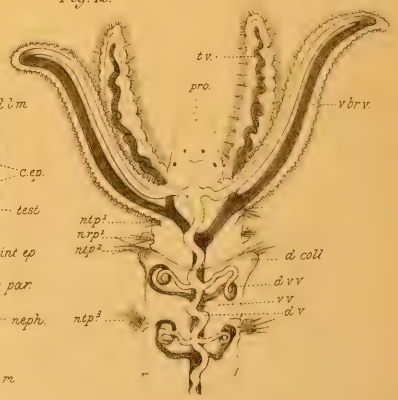
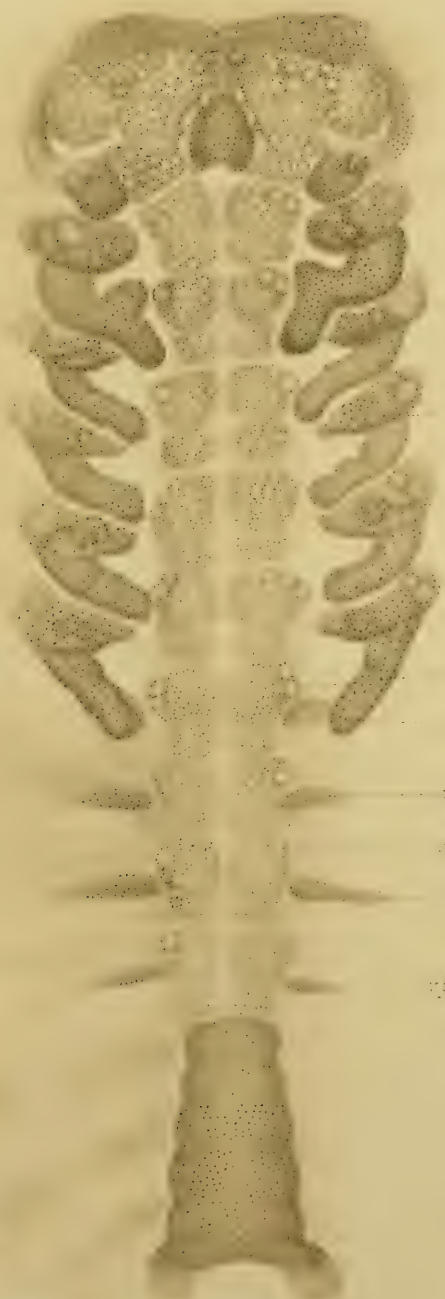


Fig. I.

Wm Patten del.

Fig. 2

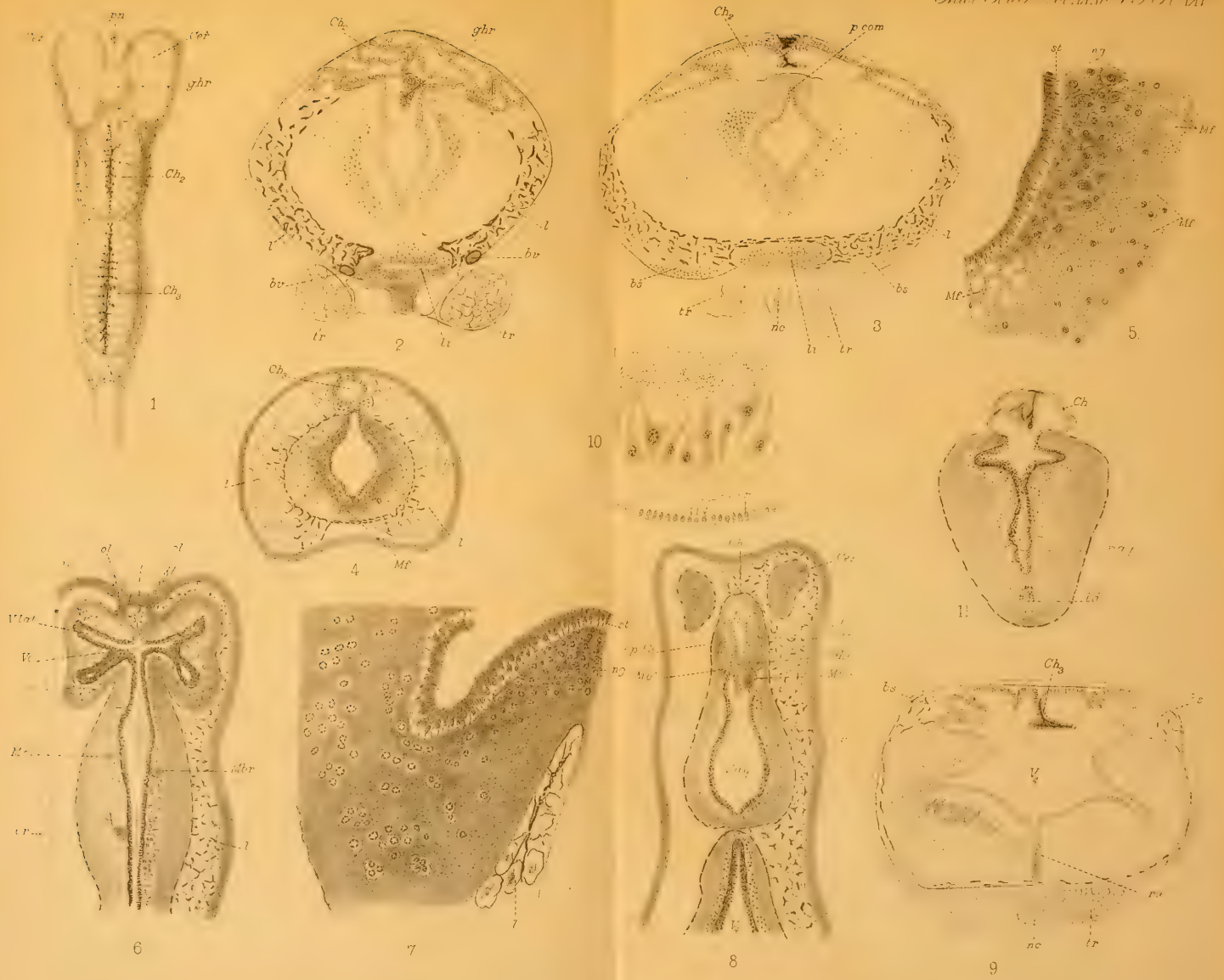


F. Huth, Lith. Edinr.

Wm Patten del

Fig. 4

F. Huth, Lith^r Edin^r


1
2
3
4
5
6
7
8
9
10
11
ghr
Ch2
Ch3
p com
bs
tr
nc
Mf
Ch
st
ng
Mbr
V4

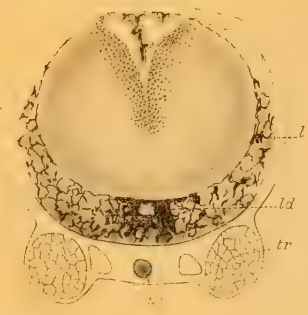
12

13a

13b

13c

13d



13e

14

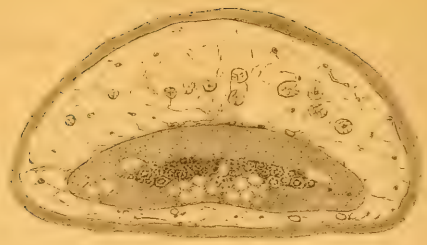
15

16

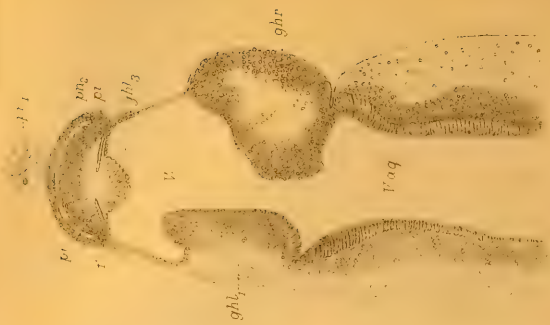
18

17

Lith & Imp Camb. Sci. Inst Co



19



21.

20a

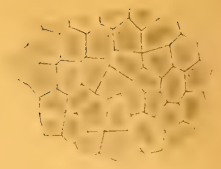
20b

20c

20d

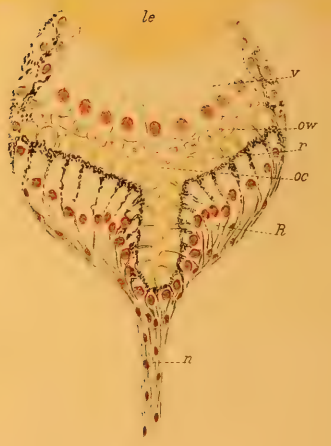
Lith & Imp Camb. Sci. Inst Co.

22



23.

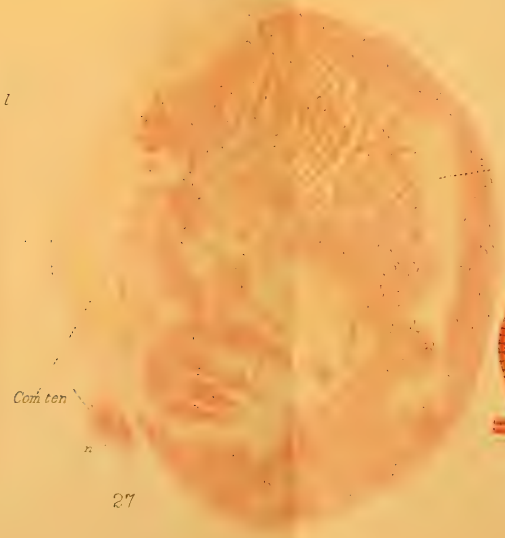
24.



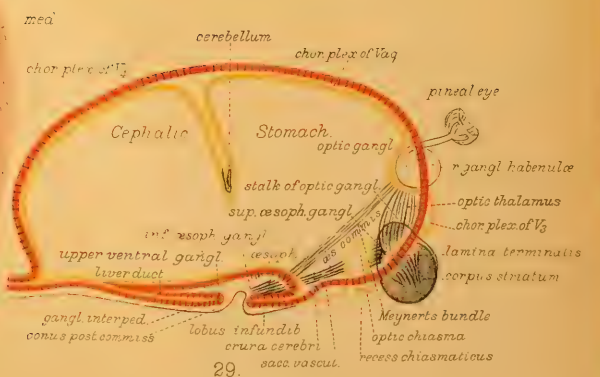
28

25.

26

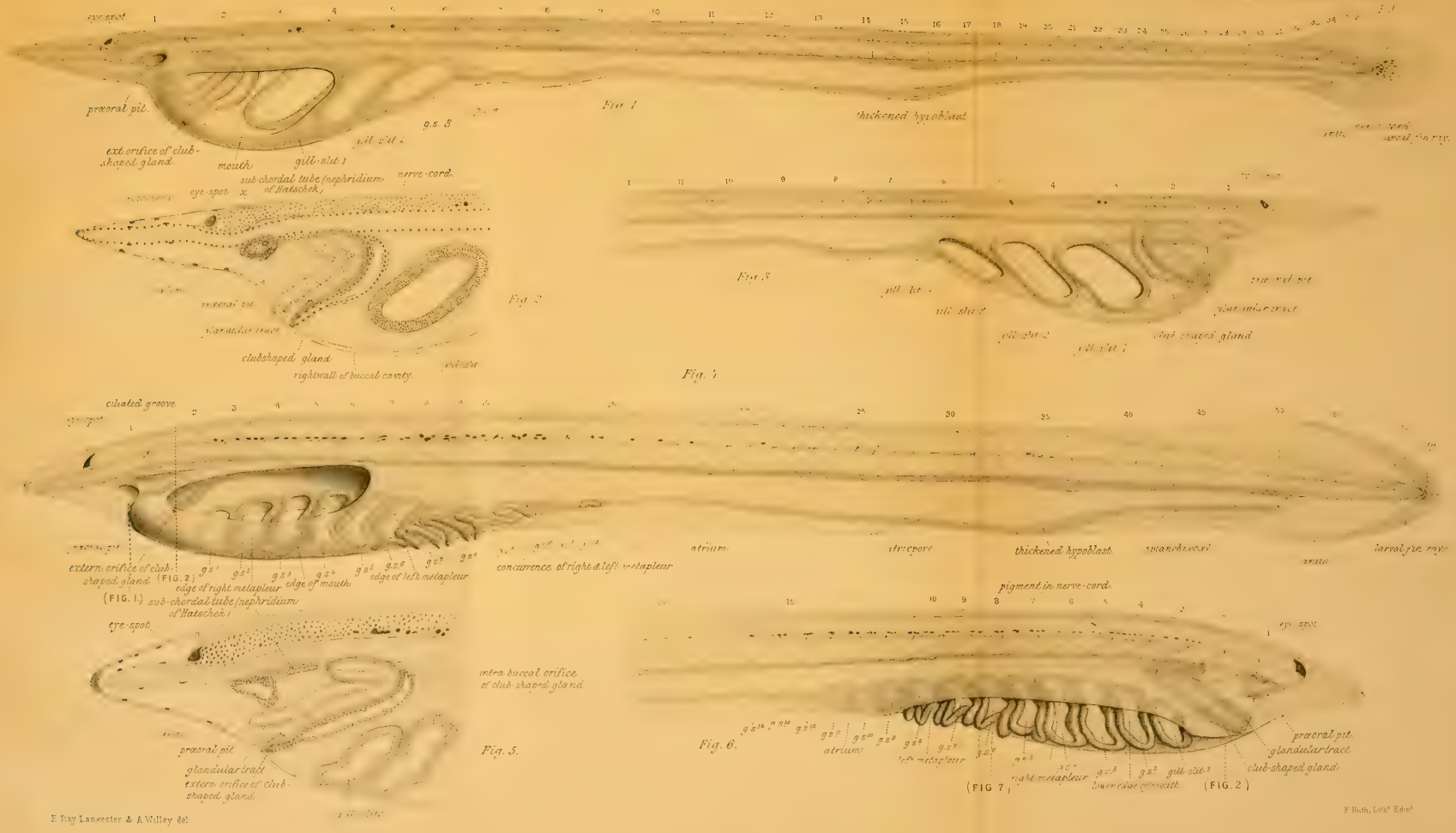


27



29.

Lith & Imp. Camb. Sci. Inst Co.



E. Ray Lancester & A. Willey del

F. Huth, Lith. Edin.

Fig. 1

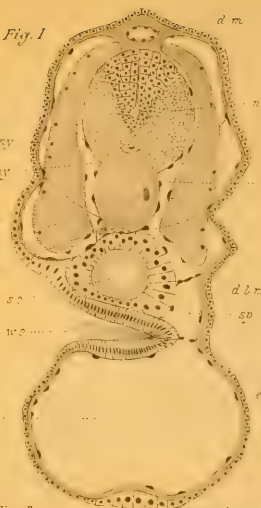


Fig. 2.

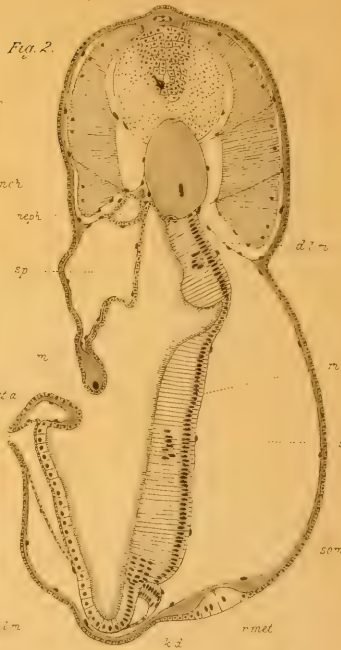


Fig. 3.

Fig. 4

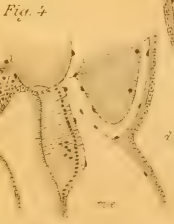


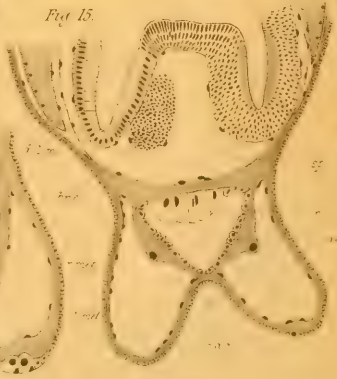
Fig. 5

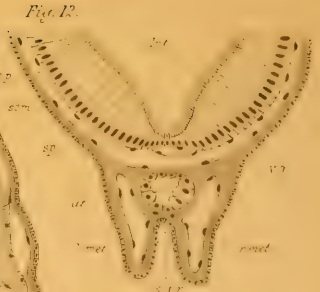
Fig. 6.

Fig. 7

Arthur Willey del

F Huth, Lith^r Edin^r





Arthur Willey del.

F. Huth, Lith.r Edin.r

Fig. 16.

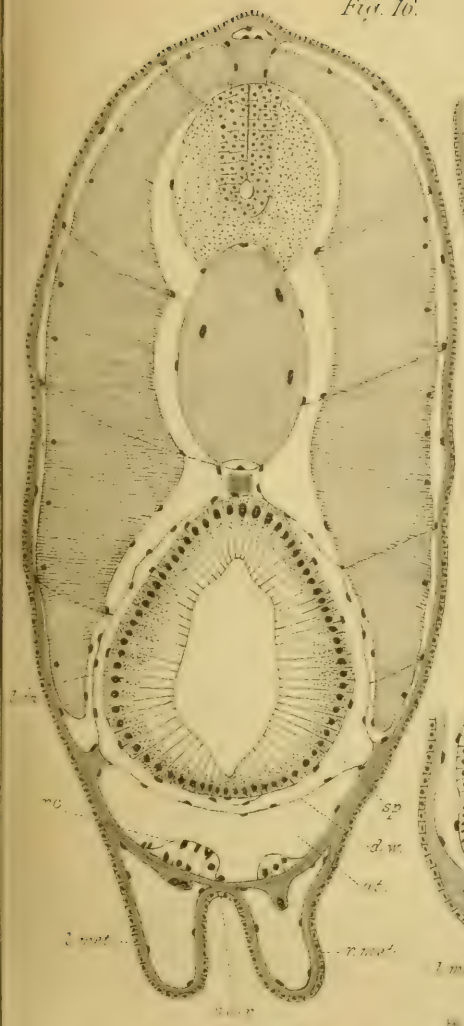


Fig. 17.

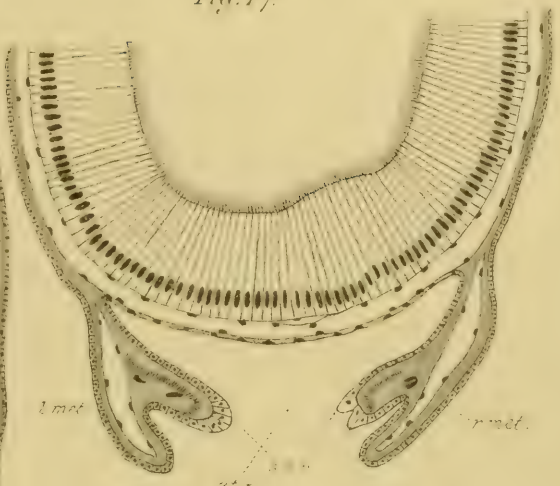


Fig. 18.

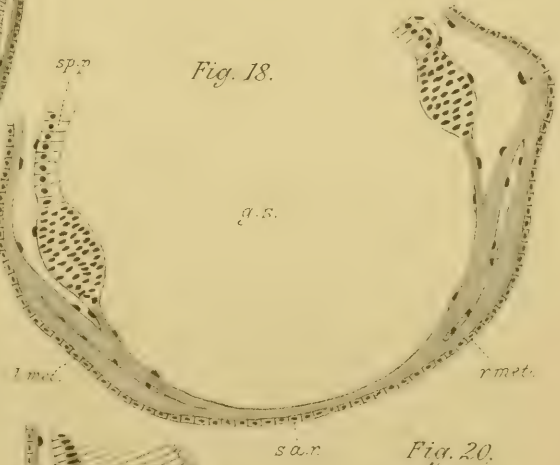
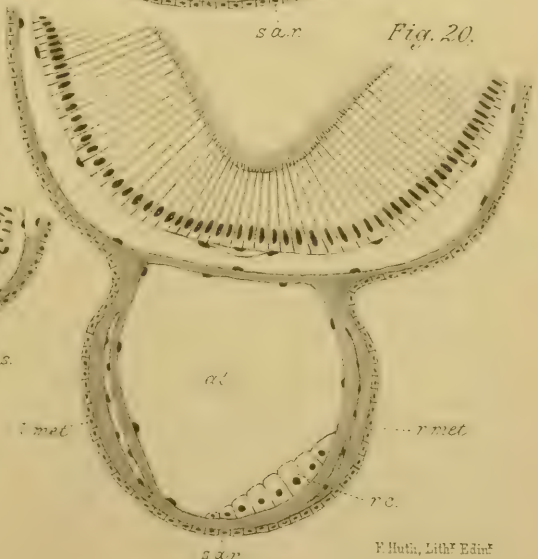


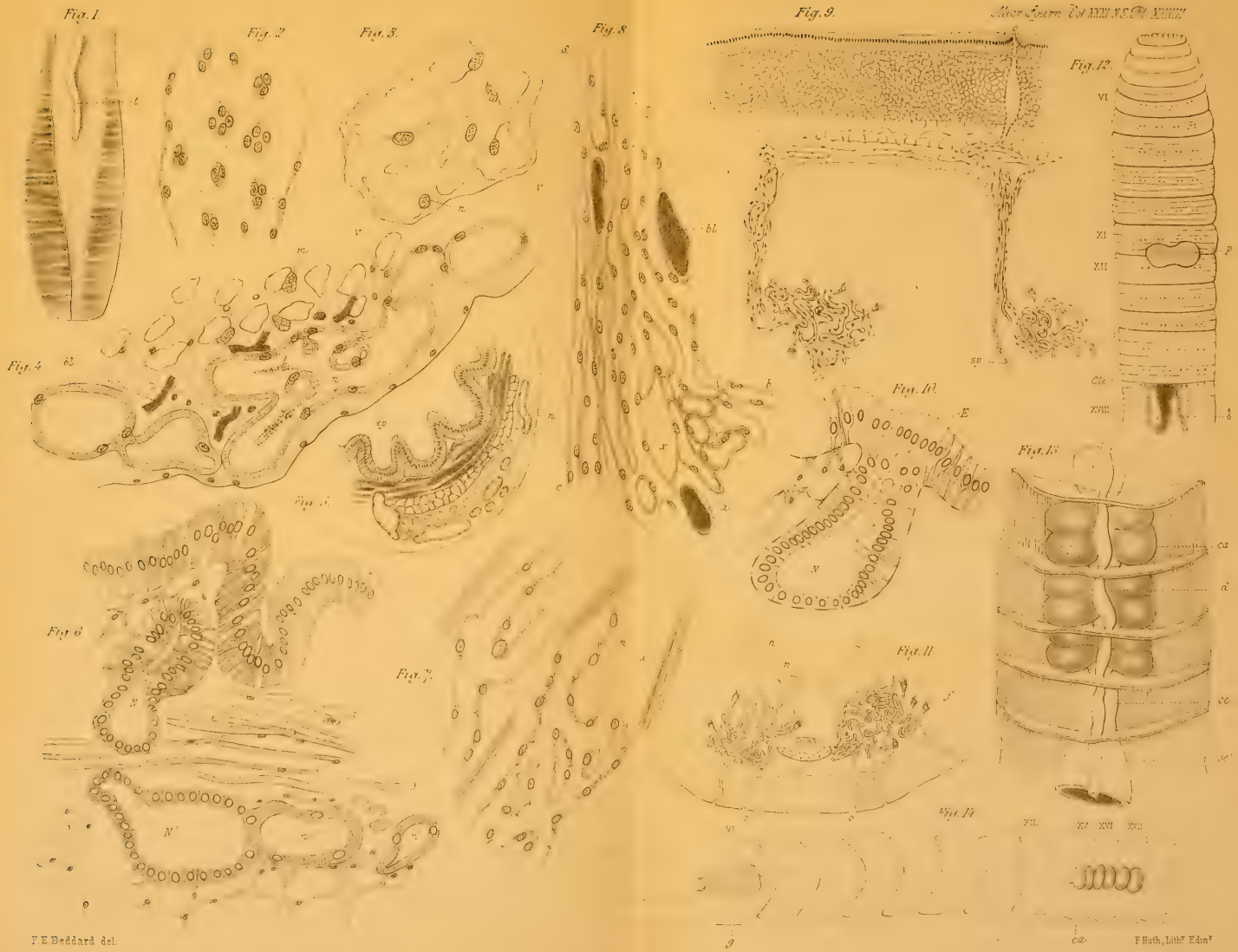
Fig. 19.

Fig. 20.



Arthur Willey del.

F. Huth, Lith. Edinr.



F. E. Beddard del.

F. Huth, Lith^r Edin^r

Fig. 15.

Fig. 16.

Fig. 17.

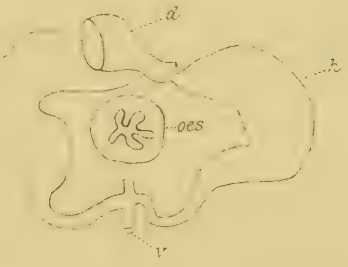
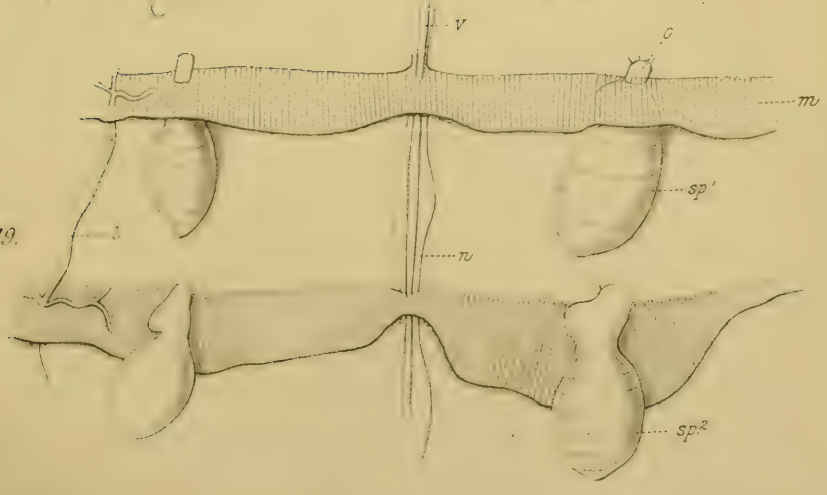
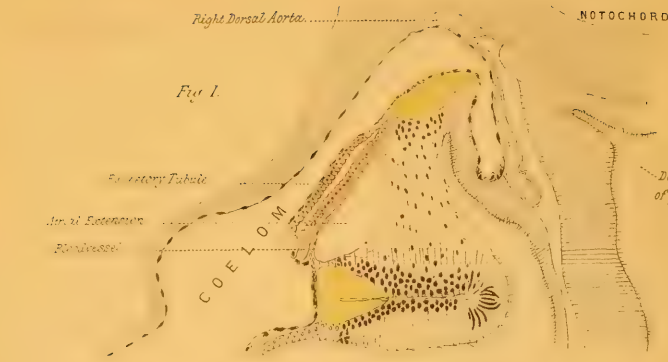
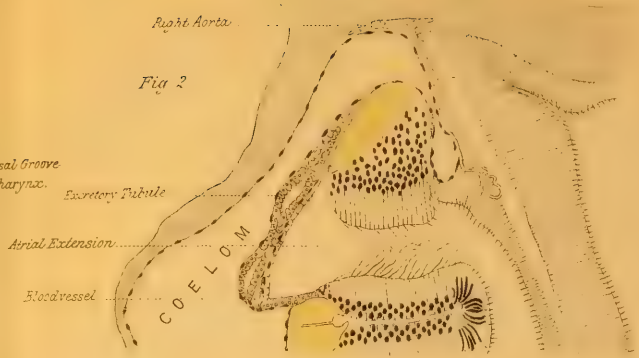


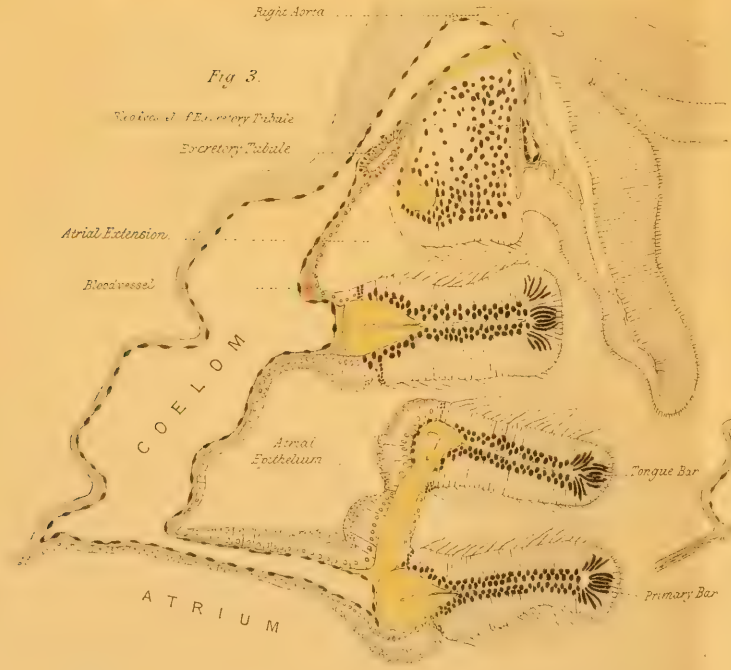
Fig. 18.

Fig. 19.









F. E. Weiss del

F. Huth, Lith^r Edin^r

Fig. 5

Fig. 6

Fig. 7

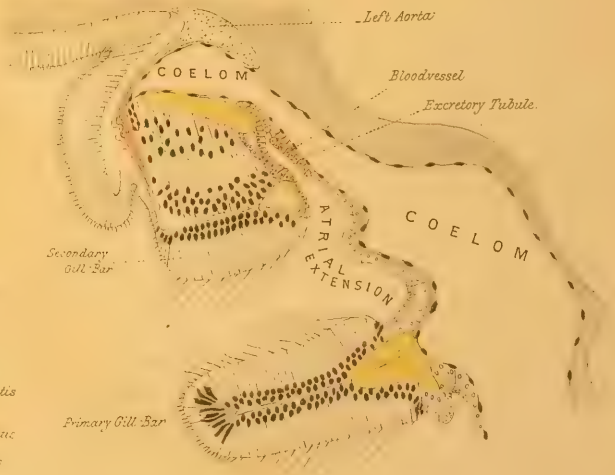


Fig. 8

F. E. Weiss del.

F. Huth, Lith^r Edin^r

F. H. & A. Lith. Edin.

Hubrecht del.

F. Huth, Lith^r Edin^r

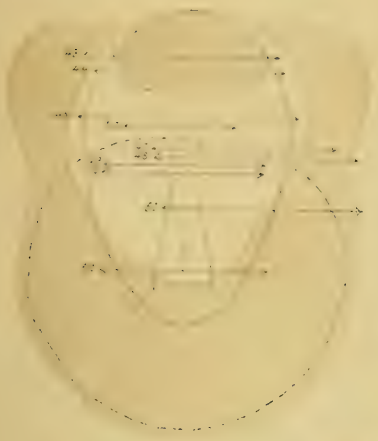


Fig. 34.

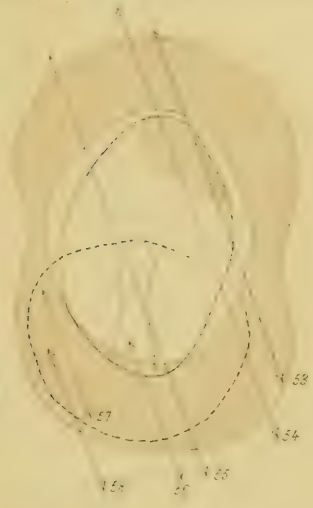


Fig. 33.

Fig. 32.

Fig. 36.

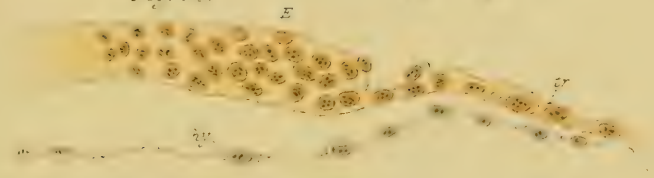


Fig. 37.

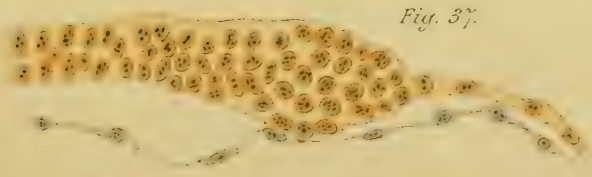


Fig. 35.

Fig. 38.

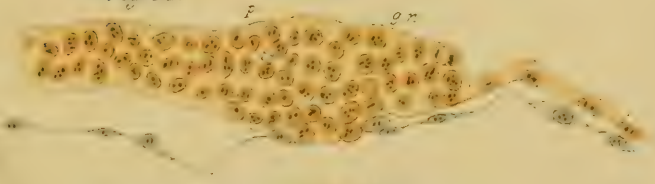


Fig. 39.

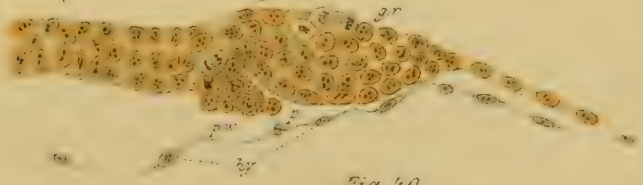
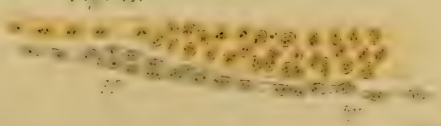


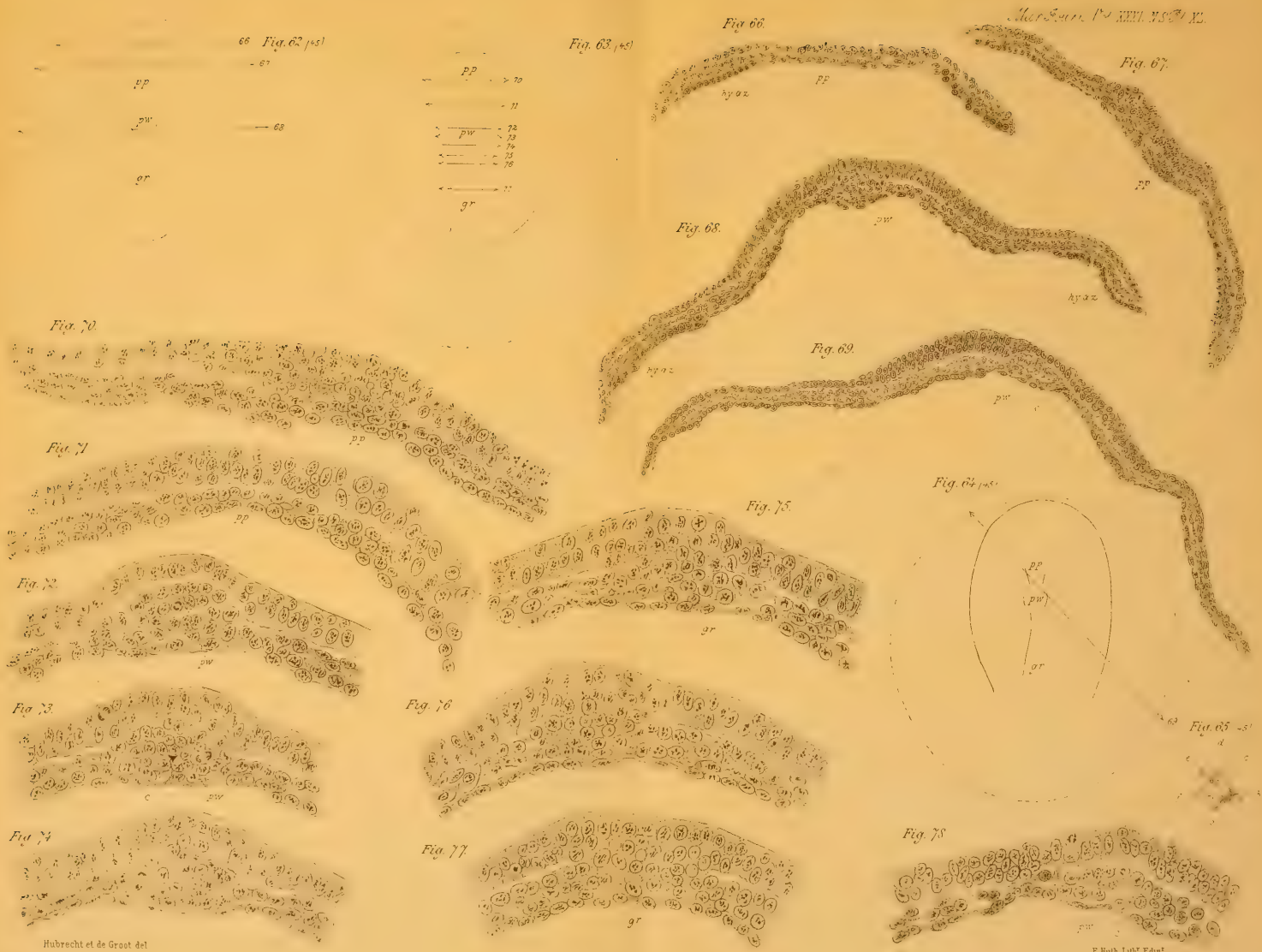
Fig. 40.

Fig. 41.



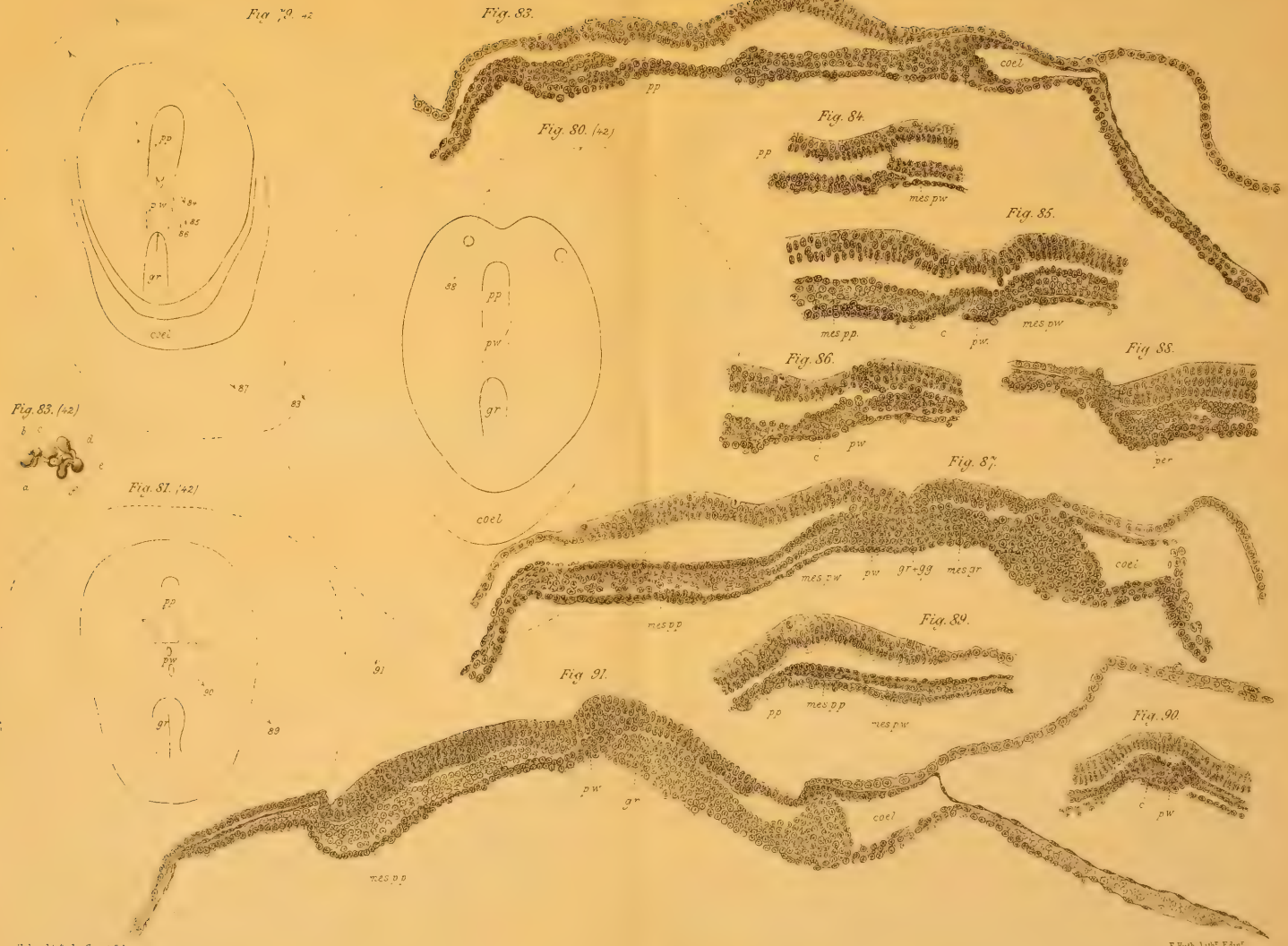
Hubrecht et de Groot del.

F. Huth, Lith.r Edin.r



Hubrecht et de Groot del

F Huth, Lith^r Edin^r



Hubrecht & de Groot del.

F Huth, Lith. Edinr.

Fig. 93.

Fig. 92.

Hubrecht del.

Fig. 95.

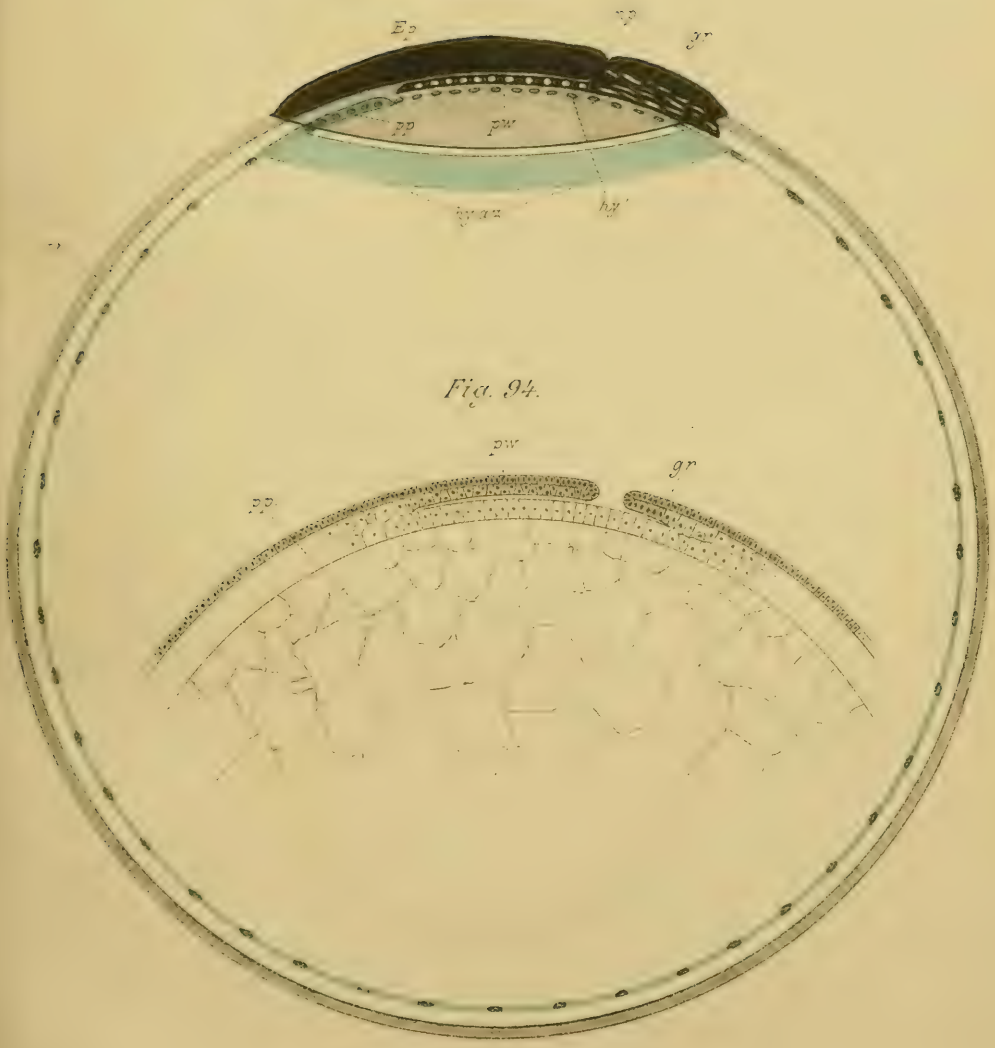


Fig. 94.

F. Huth, Lith.r Edin.r

Fig. 1.

Fig. 2.

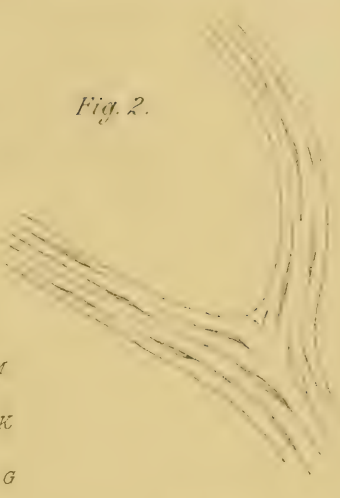
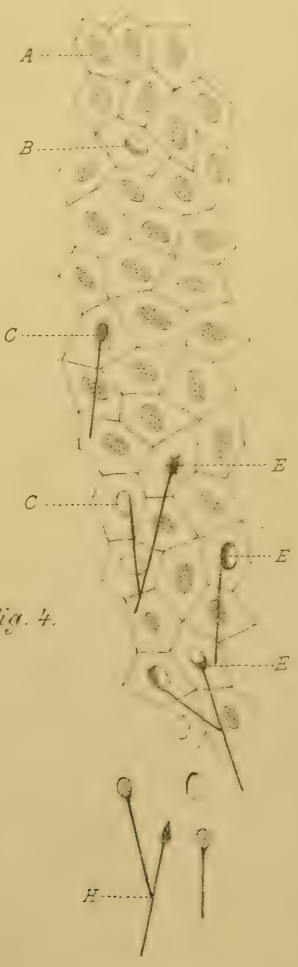


Fig. 3.

Fig. 4.



Haycraft del.

P. Huth, Lith. Edin.

ERNST MAYR LIBRARY
3 2044 110 319 746

Date Due

DEC 74